

High Power DC Electronic Load AN236(F) Series

Product Introduction

The AN236(F) Series is a new high power DC electronic load introduced by Ainuo Instrument Co., Ltd. It offers voltage ranges of 150V, 600V, and 1,200V, with power ranges from 2kW to 60kW. This series of electronic loads are mainly used for testing products in various fields such as new energy vehicle OBCs, power batteries, charging stations, power electronics, servo/server power supplies, high voltage UPS, military, photovoltaics, grid energy storage, aerospace, and more. Featuring a new generation digital controller, it comes with five basic modes, seven advanced modes, and sequence function to meet users' programming and automation test requirements.

Features

- High power density: 6kW in 4U height, and 24kW in 13U height. Compact, light, convenient.
- With precision measurement technology, it supports voltage accuracy of $0.015\% \pm 0.015\% \text{ F.S.}$, current accuracy of $0.04\% \pm 0.04\% \text{ F.S.}$, and power accuracy of $0.1\% \pm 0.1\% \text{ F.S.}$ (maintained constant at high temperatures).
- Built-in dynamic loading mode with a dynamic frequency of up to 25kHz and Vpk+- test function.
- Built-in FLEX mode for simulating capacitive loads, inductive loads, and complex impedance loads.
- Wide range, offering nearly twice the current range of traditional high power loads with the same capacity.
- Excellent dynamic characteristics, with a maximum current slew rate of 96A/us.
- Built-in functions include constant current(CC), constant voltage(CV), constant resistance(CR), constant power(CP), short circuit simulation, overcurrent protection test, sequence test, etc.
- It has comprehensive protection features including overcurrent, overvoltage, overtemperature, reverse connection, SENSE protection, etc.
- It has a built-in temperature sensing chip and a speed-controlled fan.
- It has a built-in battery mode for discharging tests for energy integration and timing.
- Versatile Interfaces – Standard configurations include six communication interfaces: LAN, GPIB, USB, CAN, RS232, and RS485, ensuring seamless integration with various test systems.



Serialized Models



The AN236(F) Series offers a complete range of models to choose from, as shown in the table below.

	150V	600V	1200V	Height
2kW	AN23602C-150-200F	AN23602C-600-140F	AN23602C-1200-80F	4U
3kW	AN23603C-150-300F	AN23603C-600-210F	AN23603C-1200-100F	4U
4kW	AN23604C-150-400F	AN23604C-600-280F	AN23604C-1200-160F	4U
5kW	AN23605C-150-500F	AN23605C-600-350F	AN23605C-1200-200F	4U
6kW	AN23606C-150-600F	AN23606C-600-420F	AN23606C-1200-240F	4U
8kW	AN23608C-150-800F	AN23608C-600-560F	AN23608C-1200-320F	7U
10kW	AN23610C-150-1000F	AN23610C-600-700F	AN23610C-1200-400F	7U
12kW	AN23612C-150-1200F	AN23612C-600-840F	AN23612C-1200-480F	7U
15kW	AN23615C-150-1500F	AN23615C-600-1050F	AN23615C-1200-600F	10U
18kW	AN23618C-150-1800F	AN23618C-600-1260F	AN23618C-1200-720F	10U
20kW	AN23620C-150-2000F	AN23620C-600-1400F	AN23620C-1200-800F	13U
24kW	AN23624C-150-2400F	AN23624C-600-1680F	AN23624C-1200-960F	13U
30kW	AN23630C-150-3000F	AN23630C-600-2100F	AN23630C-1200-1200F	20U
36kW	AN23636C-150-3600F	AN23636C-600-2520F	AN23636C-1200-1440F	20U
42kW	AN23642C-150-4200F	AN23642C-600-2800F	AN23642C-1200-1680F	24U
48kW	AN23648C-150-4800F	AN23648C-600-3360F	AN23648C-1200-1920F	24U
54kW	AN23654C-150-5400F	AN23654C-600-3780F	AN23654C-1200-2160F	28U
60kW	AN23660C-150-6000F	AN23660C-600-4200F	AN23660C-1200-2400F	32U

Any changes to the above parameter specifications will not be notified separately.

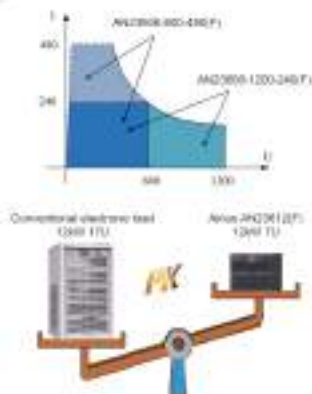
Applications

- DC charging pile/on-board charger and power electronics tests.
- Smart manufacturing and industrial motor tests.
- Automotive electronics tests, such as fuses, control boxes, etc.
- Relay simulation load test.
- Military aerospace power test.
- Server power supplies, high voltage UPS, and communication power tests.
- Battery discharge test.
- Virtual load tests for photovoltaic component array and wind power generation.
- Simulation test for energy storage systems.
- DC power supply and power electronic components.



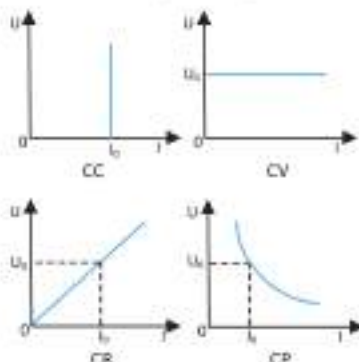
High Power Density, Compact and Wide Voltage

- The AN236(F) Series load features a wide input voltage and current range, meeting various testing needs for high current, low voltage, or high voltage, low current. With a high power density design, it has half the volume and one-third of the weight compared to traditional electronic loads.



Basic Mode

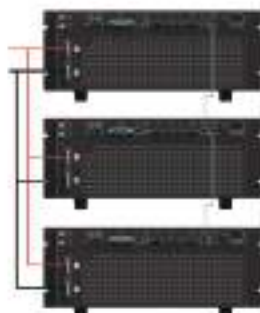
Built-in basic constant voltage(CV), constant current(CC), constant resistance(CR), and constant power(CP) modes, which can meet a wide range of testing needs.



Master/Slave Parallel Connection – Flexible Power Configuration

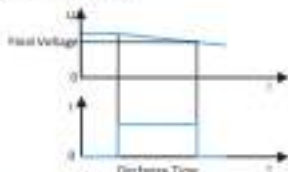
The 23600E(F) series employs digital parallel technology to achieve master/slave parallel functionality, supporting arbitrary parallel connection of different models within the same voltage rating. The maximum number of parallel units is 16, with a maximum combined power of 960 kW and a maximum combined current of 38.4 kA.

In parallel mode, only the master unit requires operation and control, providing the same convenience as a single unit. The master and slave units automatically distribute current and support multiple modes of load testing.



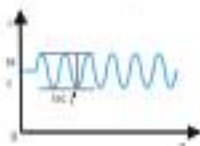
BATY Mode - Battery Test Dedicated Mode

For batteries, the AN236(F) Series load provides three discharge modes: constant current, constant resistance, and constant power modes. By setting voltage thresholds and test times (1s-100,000s), the electronic load can control the load to prevent over-discharge and battery damage. Additionally, the load also provides a display of the discharged energy. The BATY mode is also suitable for super capacitors and similar discharge testing scenarios.



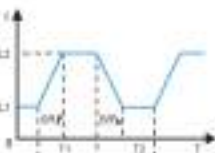
SWD Mode - Sine Wave Loading

The AN23600E(F) electronic load features a sine wave current loading function, where the current is output in a fixed-frequency sine wave. Users can control the output waveform by adjusting the DC current component (I_{DC}), the AC sine-wave component (I_{AC}), and the sine wave frequency (Frequency). The minimum point of the sine wave loading current must not fall below zero amperes, and the frequency adjustment range is 0-20 kHz. This function is widely used in fuel cell ACIR testing.



CCD Mode - Rapid Dynamic and Vpp Testing

The AN236(F) Series of loads feature built-in high-speed dynamic loading testing capabilities, with dynamic changes possible up to 25kHz. Users can set a repeating number of cycles for a specified period, ranging from 1 to 100,000, or conduct continuous dynamic loading. As illustrated in the diagram below, users can set the high and low loading values of the current, loading time, rise and fall slopes, etc. While conducting dynamic loading, the load also provides measurements of the peak-to-peak voltage, with a sampling frequency of up to 500kHz.



CRD Mode - Rapid Dynamic and Vpp Testing

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CC Mode - Ultra-Fast Loading Speed and Ultra-Low Overshoot

For example, the AN23600E-1200-240(F) can provide a rise speed of 12A/uS. While addressing fast loading issues, the load's built-in digital controller ensures minimal overshoot. The figure below shows the comparison of the current rise waveforms during full-speed loading between the AN236(F) Series load and a certain brand of electronic load.



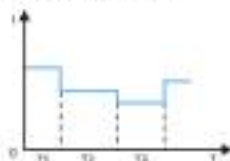
CV Mode - High-performance Controller with Adjustable Loop Speed

With the increasing application scenarios of constant current sources, the AN236(F) Series load is equipped with an optimized zero-point compensation controller. While meeting the requirements for fast, stable, and accurate loading, it offers three adjustable loop speeds, greatly expanding the load's adaptability. Unlike the ordinary integral lag control, as shown in the figure on the right, there is a distinct predictive control section. The current waveform below shows the "prediction" of the tested power supply at the earliest time, enabling a rapid and stable CV loading process.



LIST Mode - Sequence Loading Function

The AN236(F) load features a built-in sequence test function that can edit up to 8 sets of data, with each set editable for 200 steps. Each step can be edited for execution time within the range of 0-100s. In scenarios such as battery discharge, server, and communication power mixed load modulation, providing different load current waveforms as an effective supplement for dynamic current tests.



High Precision Measurement

The AN236(F) Series load offers three grade for voltage and current measurements. Taking the AN23606E-1200-240 as an example, it provides voltage ranges of 150V/600V/1,200V, catering to the needs of low, medium, and high voltage ranges. For current measurement, it offers 24A/120A/240A, providing more accurate measurement values for different application scenarios. Utilizing high-precision A/D and D/A chips, it supports accuracies of voltage $0.015\%+0.015\%F.S.$, current $0.04\%+0.04\%F.S.$, and power $0.1\%+0.1\%F.S.$

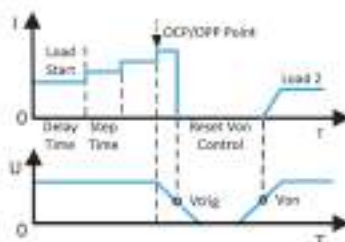
Instantaneous Overpower Function

The AN236(F) Series load has an instant 2 times overpower capability, allowing the load to withstand a load capacity exceeding the rated power for a short period of time. This effectively solves the selection issue for impact-type products. Users can select based on the rated power of the power supply or battery, rather than the maximum power, which saves costs and improves adaptability.

Precisely Lock Power Protection Point

Too large output current/power of the source under test may cause damage. Therefore, most of the power sources under test have overcurrent/overpower protection; the output voltage is reduced or stopped when overloaded. So this kind of load provides test modes for this situation. Over Current Point, Over Power Point (OCP, OPP).

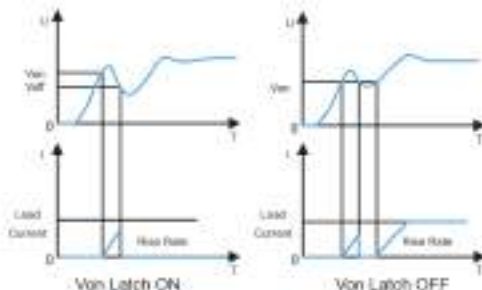
When the load detects that the voltage is less than or equal to the threshold after setting the loading current and the threshold, the loading stops, and the current power at the moment of protection is displayed on the screen, and the result is judged according to the protection point.



Von/Voff Function - Flexible Voltage Protection

During the power-on moment of the DUT (Device Under Test) when the output hasn't stabilized yet, immediate loading by the load can lead to the failure of the DUT's startup, making voltage oscillations or damage to the DUT. Some DUTs cannot tolerate excessively low operating voltages, such as battery systems, where over-discharge can cause irreversible damage to the batteries. Therefore, the load provides a flexible automatic load and unload function - Von/Voff.

Once the voltage judgment is set, the load will remain unloaded when the voltage detected is lower than the V_{on} voltage. It will start loading only when the voltage rises above the V_{on} voltage, thus ensuring the startup voltage protection of the DUT. The automatic unload depends on the setting of V_{off} . If set to ON, the load unloads when the voltage is below V_{off} , and it won't load again. If set to OFF, the load unloads when the voltage is below V_{on} , and it will reload when the voltage is higher than V_{on} .



Visual Programming Software

Users can test by using the PC software programming load. It will be troublesome to set the series test (List) via load interface but can be set quickly via the graphical interface of the host, cooperated with the wave drawing, convenient for the testers. Over Current Point, Over Power Point (OCP, OPP), the host will store the test results and process data automatically, and generate a test result report.



Data Acquisition Function

Users can utilize the load's data acquisition function in conjunction with a trigger source to capture instantaneous voltage and current data.

The upper computer software can then plot the data points into waveforms, and the test data can be exported to excel.

Sampling time: 1-40 microsecond, resolution: 1 microsecond; Number of sampling points: 1-1,024 (total number of sampling points).

Trigger source: Load on/Load off/TTLBUS/Manual



Panel Instructions



No.	Name	Description
①	Power supply switch	AC power supply switch of the electronic load (master unit)
②	F1PS Main	F1.5S, short-circuit mode
③	Display screen	Shows settings and measured data
④	Direction key	Left and right key
⑤	Knob	Used for moving cursor up and down and adjusting parameters
⑥	Indicator light	Indicator light for load working status
⑦	Control button	LOAD, MENU, ESC, BYTDR
⑧	Number key	Number keys 0-9 and undo key



No.	Name	Description
①	DC load terminal	Load terminal
②	Voltage terminal	Remote detection of power supply voltage
③	RS485/CAN	485 Communication Interface, CAN Communication Interface
④	OPB	OPB Communication
⑤	LAN	Standard Ethernet Communication Interface
⑥	USB-B	Standard USB Communication Interface, PC Connectable
⑦	RS232	Standard RS232 Communication Interface
⑧	I Monitor	Load current waveform detection
⑨	V Monitor	Load voltage waveform detection
⑩	Digital IO	Multiple input/output signals
⑪	Parallel terminal	Parallel connection port
⑫	Ground terminal	Connected to the ground
⑬	Power input	Power supply input

Specifications

Model		AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)
Working range	Voltage	0-150V					
	Current	0-200A	0-200A	0-400A	0-500A	0-800A	0-800A
	Power	2kW	2kW	4kW	5kW	8kW	8kW
Minimum working voltage		1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V
Constant current loading	Range	20/180/200A	30/150/200A	40/200/400A	50/250/500A	60/300/600A	60/400/800A
	Resolution	0.01/0.1mA	0.01/0.1mA	0.02/0.1mA	0.02/0.1mA	0.02/0.1mA	0.02/0.1mA
	Accuracy	±0.05%±0.05mV					
Constant voltage loading	Range	0-50/150V					
	Resolution	0.1/0.51mV					
	Accuracy	±0.025%±0.025mV					
Constant resistance load	Range	15mΩ-150Ω(15V) 60mΩ-600Ω(80V) 1.5Ω-3000Ω(150V)	10mΩ-100Ω(15V) 40mΩ-400Ω(80V) 1Ω-3000Ω(150V)	7.5mΩ-75Ω(15V) 30mΩ-300Ω(80V) 0.75Ω-150Ω(150V)	5mΩ-50Ω(15V) 20mΩ-200Ω(80V) 0.5Ω-100Ω(150V)	3mΩ-30Ω(15V) 15mΩ-150Ω(80V) 0.3Ω-100Ω(150V)	3.5mΩ-35Ω(15V) 15mΩ-150Ω(80V) 0.35Ω-75Ω(150V)
	Resolution	2mΩ/Volts	2mΩ/Volts	2mΩ/Volts	2mΩ/Volts	2mΩ/Volts	2mΩ/Volts
	Accuracy	±0.025%±0.025mV					
Constant power loading	Range	20/100/200W	30/150/200W	40/200/400W	50/250/500W	60/300/600W	60/400/800W
	Resolution	0.2/0.5W	0.2/0.5W	0.2/0.5W	0.2/0.5W	0.2/0.5W	0.2/0.5W
	Accuracy	±0.25%±0.25mV					
Current change rate	Setting range	0.2mA/s-2A/s (20A) 1mA/s-7A/s (100A) 2mA/s-14A/s (200A)	0.2mA/s-3A/s (30A) 1mA/s-15A/s (100A) 2mA/s-21A/s (200A)	0.4mA/s-4A/s (40A) 2mA/s-14A/s (200A) 4mA/s-28A/s (400A)	0.5mA/s-5A/s (50A) 2mA/s-17A/s (200A) 5mA/s-35A/s (500A)	0.5mA/s-6A/s (60A) 2mA/s-21A/s (200A) 5mA/s-42A/s (600A)	0.5mA/s-6A/s (60A) 2mA/s-21A/s (200A) 5mA/s-42A/s (600A)
		0.2mA/s-2A/s (20A)	0.2mA/s-3A/s (30A)	0.4mA/s-4A/s (40A)	0.5mA/s-5A/s (50A)	0.5mA/s-6A/s (60A)	0.5mA/s-6A/s (60A)
		1mA/s-7A/s (100A)	1mA/s-15A/s (100A)	2mA/s-14A/s (200A)	2mA/s-17A/s (200A)	2mA/s-21A/s (200A)	2mA/s-21A/s (200A)
		2mA/s-14A/s (200A)	2mA/s-21A/s (200A)	4mA/s-28A/s (400A)	5mA/s-35A/s (500A)	5mA/s-42A/s (600A)	5mA/s-42A/s (600A)
	Resolution	0.01/0.1mA/s	0.01/0.1mA/s	0.02/0.1mA/s	0.02/0.1mA/s	0.02/0.1mA/s	0.02/0.1mA/s
Specification	Dimensions	425mm×177mm×80mm(W×H×D) This height can be increased by 20mm with detachable feet.					420mm×400mm +60mm (W×H×D)
	Weight	24.5kg	26.5kg	29.5kg	32kg	35kg	37kg

Any changes to the above parameter specifications will not be notified separately.

Model		AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)	AL2302E (10-200A)
Working range	Voltage	0-150V					
	Current	0-1800A	0-1200A	0-1500A	0-1800A	0-2000A	0-2000A
	Power	15kW	12kW	15kW	18kW	24kW	24kW
Minimum working voltage		1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V	1.8V±0.004V
Constant current loading	Range	10/50/1000A	10/40/1200A	10/50/1500A	10/50/1800A	10/50/2000A	10/50/2400A
	Resolution	0.1/1mA	0.1/1mA	0.1/1mA	0.1/1mA	0.1/1mA	0.1/1mA
	Accuracy	±0.05%±0.05mV					
Constant voltage loading	Range	0-50/150V					
	Resolution	0.1/0.51mV					
	Accuracy	±0.025%±0.025mV					
Constant resistance load	Range	2.5mΩ-250Ω(15V) 12mΩ-1000Ω(80V) 0.25Ω-500Ω(150V)	2.5mΩ-250Ω(15V) 10mΩ-1000Ω(80V) 0.25Ω-500Ω(150V)	1.7mΩ-167Ω(15V) 6.7mΩ-667Ω(80V) 0.167Ω-333Ω(150V)	1.7mΩ-167Ω(15V) 6.7mΩ-667Ω(80V) 0.167Ω-333Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.125Ω-250Ω(150V)
	Resolution	10mA/Volts	10mA/Volts	20mA/Volts	20mA/Volts	20mA/Volts	20mA/Volts
	Accuracy	±0.025%±0.025mV					
Constant power loading	Range	100/500/1000W	120/600/1200W	150/750/1500W	180/900/1800W	240/1200/2400W	240/1200/2400W
	Resolution	20/10/200W	20/10/200W	40/20/400W	40/20/400W	40/20/400W	40/20/400W
	Accuracy	±0.25%±0.25mV					
Current change rate	Setting range	1mA/s-10A/s (10A) 5mA/s-27.5A/s (60A) 15mA/s-55A/s (100A)	1mA/s-12A/s (12A) 5mA/s-30A/s (60A) 15mA/s-60A/s (100A)	2mA/s-15A/s (15A) 15mA/s-30A/s (70A) 20mA/s-60A/s (100A)	2mA/s-18A/s (18A) 15mA/s-36A/s (90A) 25mA/s-72A/s (180A)	2mA/s-20A/s (20A) 15mA/s-40A/s (100A) 25mA/s-80A/s (200A)	2mA/s-24A/s (24A) 15mA/s-48A/s (120A) 25mA/s-96A/s (240A)
		1mA/s-10A/s (10A)	1mA/s-12A/s (12A)	2mA/s-15A/s (15A)	2mA/s-18A/s (18A)	2mA/s-20A/s (20A)	2mA/s-24A/s (24A)
		5mA/s-27.5A/s (60A)	5mA/s-30A/s (60A)	15mA/s-30A/s (70A)	15mA/s-36A/s (90A)	15mA/s-40A/s (100A)	15mA/s-48A/s (120A)
		15mA/s-55A/s (100A)	15mA/s-60A/s (100A)	20mA/s-60A/s (100A)	25mA/s-72A/s (180A)	25mA/s-80A/s (200A)	25mA/s-96A/s (240A)
	Resolution	0.1/1mA/s	0.1/1mA/s	0.1/1mA/s	0.1/1mA/s	0.1/1mA/s	0.1/1mA/s
Specification	Dimensions	425mm×400mm×650mm (W×H×D)					425mm×400mm×650mm (W×H×D)
	Weight	65.5kg	72kg	92.5kg	98kg	112kg	122kg

Any changes to the above parameter specifications will not be notified separately.

Specifications

Model	AL2300E (60-2400V)	AL2300E (60-2400V)	AL2342E (60-2400V)	AL2342E (60-2400V)	AL2342E (60-2400V)	AL2342E (60-2400V)
Working range	Voltage	0-180V				
	Current	0-2400A	0-2400A	0-2400A	0-2400A	0-2400A
	Power	30W	30W	42W	42W	54W
Minimum working voltage		1.8V(0.2400A)	1.8V(0.2400A)	1.8V(0.2400A)	1.8V(0.2400A)	1.8V(0.2400A)
Constant current loading	Range	240-1200-2400A	240-1200-2400A	240-1200-2400A	240-1200-2400A	240-1200-2400A
	Resolution	21000mA	21000mA	21000mA	21000mA	21000mA
	Accuracy	±0.05%+0.05mV				
Constant voltage loading	Range	0.00-150V				
	Resolution	0.10.01mV				
	Accuracy	0.03%+0.025mV				
Constant resistance load	Range	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.135Ω-250Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.135Ω-250Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.135Ω-250Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.135Ω-250Ω(150V)	1.3mΩ-12.5Ω(15V) 5mΩ-500Ω(80V) 0.135Ω-250Ω(150V)
	Resolution	20mA/Vsource	20mA/Vsource	20mA/Vsource	20mA/Vsource	20mA/Vsource
	Accuracy	Vsource/12.2%+0.2mV				
Constant power loading	Range	300/1500/3000W	300/1500/3000W	420/2100/4200W	420/2100/4200W	540/2700/5400W
	Resolution	200/100/2000W	200/100/2000W	200/100/2000W	200/100/2000W	400/200/4000W
	Accuracy	0.2%+0.25mV				
Current change rate	Setting range	2mA/us-24A/us (240A)	2mA/us-24A/us (240A)	2mA/us-24A/us (240A)	2mA/us-24A/us (240A)	2mA/us-24A/us (240A)
		10mA/us-48A/us (1200A)	10mA/us-48A/us (1200A)	10mA/us-48A/us (1200A)	10mA/us-48A/us (1200A)	10mA/us-48A/us (1200A)
		20mA/us-96A/us (2400A)	20mA/us-96A/us (2400A)	20mA/us-96A/us (2400A)	20mA/us-96A/us (2400A)	20mA/us-96A/us (2400A)
		Resolution	21000mA/us	21000mA/us	21000mA/us	21000mA/us
	Dimensions	810mm×1410mm +80mm (W×H×D)	810mm×1410mm +80mm (W×H×D)	810mm×1762mm +80mm (W×H×D)	810mm×1762mm +80mm (W×H×D)	810mm×1940mm +80mm (W×H×D)
Specification	Weight	265kg	271kg	273kg	288kg	409kg

Any changes to the above parameter specifications will not be notified separately.

Model	AL2300E (60-140V)	AL2300E (60-140V)	AL2342E (60-240V)	AL2342E (60-240V)	AL2342E (60-240V)	AL2342E (60-240V)
Working range	Voltage	0-600V				
	Current	0-140A	0-210A	0-280A	0-300A	0-500A
	Power	30W	30W	42W	54W	81W
Minimum working voltage		1.8V(0.140A)	1.8V(0.210A)	1.8V(0.280A)	1.8V(0.300A)	1.8V(0.500A)
Constant current loading	Range	140-70-140A	210-105-210A	280-140-280A	300-150-300A	500-250-500A
	Resolution	0.210mA	0.210mA	0.280mA	0.300mA	0.500mA
	Accuracy	±0.05%+0.05mV				
Constant voltage loading	Range	0.00-150V				
	Resolution	0.10.01mV				
	Accuracy	0.03%+0.025mV				
Constant resistance load	Range	0.15Ω-150Ω(80V) 0.00-500Ω(150V) 80-1200Ω(300V)	0.10-100Ω(80V) 0.40-400Ω(150V) 40-600Ω(300V)	0.10-150Ω(80V) 0.40-600Ω(150V) 10-800Ω(300V)	0.10-150Ω(80V) 0.40-600Ω(150V) 10-800Ω(300V)	0.10-150Ω(80V) 0.40-600Ω(150V) 10-800Ω(300V)
	Resolution	2mA/Vsource	2mA/Vsource	4mA/Vsource	4mA/Vsource	5mA/Vsource
	Accuracy	Vsource/12.2%+0.2mV				
Constant power loading	Range	30/100/300W	30/100/300W	42/200/400W	54/250/500W	80/400/800W
	Resolution	50/100/300W	50/100/300W	100/200/400W	100/200/400W	200/400/800W
	Accuracy	0.2%+0.25mV				
Current change rate	Setting range	0.2mA/us-0.6A/us (14A)	0.2mA/us-0.6A/us (21A)	0.2mA/us-1.2A/us (28A)	0.2mA/us-1.5A/us (30A)	0.2mA/us-1.5A/us (50A)
		1mA/us-3A/us (70A)	1mA/us-4.5A/us (105A)	2mA/us-6A/us (140A)	2mA/us-7.5A/us (150A)	2mA/us-9A/us (210A)
		2mA/us-6A/us (140A)	2mA/us-9A/us (210A)	4mA/us-12A/us (280A)	4mA/us-15A/us (300A)	5mA/us-18A/us (400A)
		Resolution	0.210mA/us	0.280mA/us	0.300mA/us	0.500mA/us
	Dimensions	420mm×177mm×600mm(W×H×D) The height can be increased by 201mm with detachable feet.				
Specification	Weight	28.5kg	29.5kg	29.5kg	35kg	61kg

Any changes to the above parameter specifications will not be notified separately.

Specifications

Model		AL2012E 400-700A	AL2012E 400-800A	AL2012E 400-1000A	AL2012E 400-1200A	AL2012E 400-1400A	AL2012E 400-1800A
Working range	Voltage	0-600V					
	Current	0-700A	0-800A	0-1000A	0-1200A	0-1400A	0-1800A
	Power	10kW	12kW	15kW	20kW	24kW	24kW
Minimum working voltage		14V@270A	14V@240A	14V@200A	14V@200A	14V@140A	14V@160A
Constant current loading	Range	70/50/700A	84/20/840A	105/25/1050A	126/30/1260A	140/30/1400A	168/30/1680A
	Resolution	0.50/50mA	1/10mA	1/10mA	1/10mA	2/100mA	2/100mA
	Accuracy	0.05%+0.05%FS					
Constant voltage loading	Range	80/150/60V					
	Resolution	0.5/15mV					
	Accuracy	0.025%+0.025%FS					
Constant resistance load	Range	25Ω-250Ω(80V) 8/10/100Ω(160V) 10/200Ω(600V)	25Ω-250Ω(80V) 8/10/100Ω(160V) 10/200Ω(600V)	17Ω-180Ω(70/80V) 670/880/670Ω(160V) 0.87/100/340Ω(600V)	17Ω-180Ω(80V) 670/880/670Ω(150V) 0.87/100/340Ω(600V)	13Ω-125Ω(80V) 50Ω/600Ω(160V) 0.90/100Ω(600V)	13Ω-125Ω(80V) 50Ω/600Ω(160V) 0.90/100Ω(600V)
	Resolution	5mA/Vsense	10mA/Vsense	10mA/Vsense	10mA/Vsense	33mA/Vsense	33mA/Vsense
	Accuracy	V _{in} V _{out} ± 2% + 0.2mV ±					
Constant power loading	Range	1000/600/3000W	1200/600/3200W	1500/750/3900W	1800/900/4800W	2400/1200/6000W	2400/1200/6000W
	Resolution	20/100/200W	20/100/200W	40/200/400W	40/200/400W	100/500/1000W	100/500/1000W
	Accuracy	0.2%+0.2%FS					
Current change rate	Setting range	0.5mA/s-2.1A/s (70A)	1mA/s-2.4A/s (84A)	1mA/s-2.7A/s (105A)	1mA/s-3A/s (126A)	2mA/s-3.3A/s (140A)	2mA/s-3.5A/s (168A)
		2.5mA/s-10.5A/s (250A)	5mA/s-12A/s (420A)	5mA/s-12.5A/s (525A)	5mA/s-15A/s (630A)	10mA/s-16.5A/s (700A)	10mA/s-18A/s (840A)
		5mA/s-21A/s (700A)	10mA/s-24A/s (840A)	10mA/s-27A/s (1050A)	10mA/s-30A/s (1260A)	20mA/s-33A/s (1400A)	20mA/s-35A/s (1680A)
		Resolution	0.5/2.5/5mA/s	1/5/10mA/s	1/5/10mA/s	2/10/20mA/s	2/10/20mA/s
	Dimensions	430 mm×400 mm×850 mm (W×H×D)		430 mm×520 mm×850 mm (W×H×D)		430 mm×680 mm×850 mm (W×H×D)	
Specification	Weight	88.5kg		92.5kg		113kg	

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Model		AL2030E 600-2400A	AL2030E 600-2400A	AL2030E 600-2400A	AL2030E 600-2400A	AL2030E 600-2400A	AL2030E 600-2400A
Working range	Voltage	0-600V					
	Current	0-2400A	0-2400A	0-2400A	0-2400A	0-2400A	0-2400A
	Power	30kW	36kW	40kW	40kW	54kW	60kW
Minimum working voltage		14V@2100A	14V@2400A	14V@2400A	14V@2400A	14V@2400A	14V@2400A
Constant current loading	Range	210/100/2100A	240/120/2400A	240/120/2400A	240/120/2400A	240/120/2400A	240/120/2400A
	Resolution	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA
	Accuracy	0.05%+0.05%FS					
Constant voltage loading	Range	80/150/60V					
	Resolution	0.5/15mV					
	Accuracy	0.025%+0.025%FS					
Constant resistance load	Range	10Ω-100Ω(80V) 40Ω-400Ω(150V) 0.40-300Ω(600V)	9Ω-87.5Ω(80V) 4Ω-350Ω(150V) 0.350-700Ω(600V)	9Ω-87.5Ω(80V) 4Ω-350Ω(150V) 0.350-700Ω(600V)	9Ω-87.5Ω(80V) 4Ω-350Ω(150V) 0.350-700Ω(600V)	9Ω-87.5Ω(80V) 4Ω-350Ω(150V) 0.350-700Ω(600V)	9Ω-87.5Ω(80V) 4Ω-350Ω(150V) 0.350-700Ω(600V)
	Resolution	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	V _{in} V _{out} ± 2% + 0.2mV ±					
Constant power loading	Range	3000/1500/3000W	3600/1800/3600W	4000/1800/4000W	4000/2400/4000W	5400/2700/5400W	6000/3000/6000W
	Resolution	20/100/2000W	20/100/2000W	20/100/2000W	20/100/2000W	400/200/4000W	400/200/4000W
	Accuracy	0.2%+0.2%FS					
Current change rate	Setting range	2mA/s-3.6A/s (210A)	2mA/s-3.6A/s (240A)	2mA/s-3.6A/s (240A)	2mA/s-3.6A/s (240A)	2mA/s-3.6A/s (240A)	2mA/s-3.6A/s (240A)
		10mA/s-18A/s (1000A)	10mA/s-18A/s (1200A)	10mA/s-18A/s (1200A)	10mA/s-18A/s (1200A)	10mA/s-18A/s (1200A)	10mA/s-18A/s (1200A)
		20mA/s-36A/s (2100A)	20mA/s-36A/s (2400A)	20mA/s-36A/s (2400A)	20mA/s-36A/s (2400A)	20mA/s-36A/s (2400A)	20mA/s-36A/s (2400A)
		Resolution	2/10/20mA/s	2/10/20mA/s	2/10/20mA/s	2/10/20mA/s	2/10/20mA/s
	Dimensions	615 mm×1415 mm ×800 mm (W×H×D)		615 mm×1762 mm ×800 mm (W×H×D)		615 mm×1762 mm ×800 mm (W×H×D)	
Specification	Weight	229kg		272kg		258kg	

Any changes to the above parameter specifications will not be notified separately.

Specifications

Model	AN2303E (200-800V)	AN2303E (100-1200V)	AN2304E (100-1200V)	AN2305E (100-1200V)	AN2306E (100-1200V)	AN2307E (100-1200V)
Working range	Voltage	5-1200V				
	Current	0-80A	0-120A	0-160A	0-200A	0-240A
	Power	20W	30W	40W	50W	60W
Minimum working voltage	Range	20V/200A	20V/120A	20V/80A	20V/50A	20V/30A
	Resolution	0.1V/5mA	0.1V/5mA	0.1V/5mA	0.1V/5mA	0.1V/5mA
	Accuracy	±0.24%+0.06%F.S.				
Constant current loading	Range	100/600/1200V				
	Resolution	±5.0mV				
	Accuracy	0.025%+0.025%F.S.				
Constant resistance load	Range	0.30-3kΩ(150V) 1.20-12kΩ(600V) 300-60kΩ(1200V)	0.30-3kΩ(150V) 0.60-6kΩ(600V) 300-60kΩ(1200V)	0.10-1kΩ(150V) 0.60-6kΩ(600V) 150-30kΩ(1200V)	0.10-1kΩ(150V) 0.40-4kΩ(600V) 150-30kΩ(1200V)	0.10-1kΩ(150V) 0.40-4kΩ(600V) 150-30kΩ(1200V)
	Resolution	1mA/Vsense	1mA/Vsense	2mA/Vsense	2mA/Vsense	2mA/Vsense
	Accuracy	Voltage: ±3.2%+0.2%F.S.				
Constant power loading	Range	200/1000/2000W	300/1500/3000W	400/2000/4000W	500/2500/5000W	600/3000/6000W
	Resolution	500/50mW	500/50mW	1000/100mW	1000/100mW	1000/100mW
	Accuracy	0.25%+0.25%F.S.				
Current change rate	Setting range	0.1mA/us-0.6A/us (1A) 0.1mA/us-2A/us (40A) 1mA/us-4A/us (30A)	0.1mA/us-0.6A/us (12A) 0.5mA/us-3A/us (60A) 1mA/us-6A/us (120A)	0.2mA/us-0.6A/us (16A) 1mA/us-4A/us (80A) 2mA/us-8A/us (160A)	0.2mA/us-1A/us (20A) 1mA/us-5A/us (100A) 2mA/us-15A/us (200A)	0.2mA/us-1.2A/us (24A) 1mA/us-6A/us (180A) 4mA/us-12A/us (240A)
	Resolution	0.10/0.1mA/us	0.10/0.1mA/us	0.2/0.2mA/us	0.2/0.2mA/us	0.4/0.4mA/us
Specification	Dimensions	420mm×171mm×80mm(W×H×D) The height can be increased by 201mm with detachable feet				420 mm×400 mm (W×H×D)
	Weight	28.5kg	28.5kg	28.5kg	28kg	61kg

Any changes to the above parameter specifications will not be notified separately

Model	AN2303E (100-400V)	AN2303E (100-400V)	AN2304E (100-600V)	AN2305E (100-720V)	AN2306E (100-900V)	AN2307E (100-960V)
Working range	Voltage	5-1200V				
	Current	0-400A	0-480A	0-480A	0-720A	0-800A
	Power	100W	120W	150W	180W	240W
Minimum working voltage	Range	20V/400A	20V/480A	20V/480A	20V/720A	20V/800A
	Resolution	0.1V/5mA	0.1V/5mA	0.1V/5mA	0.1V/5mA	0.1V/5mA
	Accuracy	±0.24%+0.06%F.S.				
Constant voltage loading	Range	100/600/1200V				
	Resolution	±5.0mV				
	Accuracy	0.025%+0.025%F.S.				
Constant resistance load	Range	50mΩ-0.5kΩ(100V) 0.20-2kΩ(600V) 50-1kΩ(1200V)	50mΩ-0.5kΩ(150V) 0.20-3kΩ(600V) 50-15kΩ(1200V)	50mΩ-0.5kΩ(150V) 0.10-1kΩ(600V) 1.30-6.5kΩ(1200V)	50mΩ-0.5kΩ(150V) 0.10-1kΩ(600V) 1.30-6.5kΩ(1200V)	50mΩ-0.5kΩ(150V) 0.10-1kΩ(600V) 2.50-5kΩ(1200V)
	Resolution	4mA/Vsense	5mA/Vsense	5mA/Vsense	5mA/Vsense	10mA/Vsense
	Accuracy	Voltage: ±3.2%+0.2%F.S.				
Constant power loading	Range	1000/5000/10000W	1200/6000/12000W	1500/7500/15000W	1800/9000/18000W	2400/12000/24000W
	Resolution	20/100/200mW	20/100/200mW	40/200/400mW	40/200/400mW	100/500/1000mW
	Accuracy	0.25%+0.25%F.S.				
Current change rate	Setting range	0.4mA/us-1.6A/us (40A) 2mA/us-7A/us (200A) 4mA/us-14A/us (400A)	0.4mA/us-1.6A/us (48A) 2mA/us-6A/us (240A) 4mA/us-15A/us (600A)	0.5mA/us-1.6A/us (72A) 2mA/us-9A/us (300A) 5mA/us-18A/us (600A)	0.5mA/us-2A/us (20A) 2mA/us-12A/us (80A) 5mA/us-25A/us (200A)	0.5mA/us-2.4A/us (24A) 2mA/us-12A/us (80A) 5mA/us-24A/us (600A)
	Resolution	0.4/0.2mA/us	0.4/0.2mA/us	0.5/0.5mA/us	0.5/0.5mA/us	10/10mA/us
Specification	Dimensions	420 mm×400 mm (W×H×D)		420 mm×500 mm (W×H×D)		420 mm×600 mm (W×H×D)
	Weight	66.5kg	72kg	92.5kg	98kg	124kg

Any changes to the above parameter specifications will not be notified separately

Specifications

Model		AL2000E 120V-1200W	AL2000E 120V-1440W	AL2000E 120V-1680W	AL2000E 120V-1920W	AL2000E 120V-2160W	AL2000E 120V-2400W
Working range	Voltage	0-1200V					
	Current	0-1200A	0-1440A	0-1680A	0-1920A	0-2160A	0-2400A
	Power	30W	36W	42W	48W	54W	60W
Minimum working voltage		20V@1200A	20V@1440A	20V@1680A	20V@1920A	20V@2160A	20V@2400A
Constant current loading	Range	120/60/120A	144/72/144A	168/84/168A	192/96/192A	216/108/216A	240/120/240A
	Resolution	0.5/0.5mA	2/1/0.5mA	2/1/0.5mA	2/1/0.5mA	2/1/0.5mA	2/1/0.5mA
	Accuracy	±0.4%+0.06mA					
Constant voltage loading	Range	150/60/120V					
	Resolution	1.5/10mV					
	Accuracy	0.05%+0.03%FS					
Constant resistance load	Range	30mΩ-0.2Ω/150V; 80mΩ-0.4Ω/300V; 20-4Ω/1200V	17mΩ-0.17Ω/150V; 47mΩ-0.67Ω/300V; 1-17Ω/1200V	14mΩ-0.14Ω/150V; 37mΩ-0.57Ω/300V; 1-47Ω/1200V	13mΩ-0.13Ω/150V; 36mΩ-0.56Ω/300V; 1.5-17.5Ω/1200V	11mΩ-0.11Ω/150V; 34mΩ-0.54Ω/300V; 1.1-17.1Ω/1200V	10mΩ-0.1Ω/150V; 30mΩ-0.4Ω/300V; 1-16.5Ω/1200V
	Resolution	10mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	±0.4%+0.03%FS					
Constant power loading	Range	3000/1500/3000W	3600/1800/3600W	4200/2100/4200W	4800/2400/4800W	5400/2700/5400W	6000/3000/6000W
	Resolution	200/100/200W	280/140/280W	330/165/330W	380/190/380W	420/210/420W	480/240/480W
	Accuracy	0.2%+0.2%FS					
Current change rate	Setting range	1mA/1s-2.4A/1s (120A)	2mA/1s-2.4A/1s (144A)	2mA/1s-2.4A/1s (168A)	2mA/1s-2.4A/1s (192A)	2mA/1s-2.4A/1s (216A)	2mA/1s-2.4A/1s (240A)
		5mA/1s-12A/1s (600A)	10mA/1s-12A/1s (720A)	10mA/1s-12A/1s (840A)	10mA/1s-12A/1s (960A)	10mA/1s-12A/1s (1080A)	10mA/1s-12A/1s (1200A)
		10mA/1s-24A/1s (1200A)	20mA/1s-24A/1s (1440A)	20mA/1s-24A/1s (1680A)	20mA/1s-24A/1s (1920A)	20mA/1s-24A/1s (2160A)	20mA/1s-24A/1s (2400A)
Specification	Dimensions	610 mm×1410 mm +80 mm	610 mm×1410 mm +80 mm	610 mm×1762 mm +80 mm	610 mm×1762 mm +80 mm	610 mm×1940 mm +80 mm	610 mm×1722 mm +80 mm
		(W×H×D)	(W×H×D)	(W×H×D)	(W×H×D)	(W×H×D)	(W×H×D)
		265kg	331kg	373kg	399kg	435kg	486kg

Any changes to the above parameter specifications will not be notified separately.

Model		Common Parameters		
Voltage		150V	800V	1200V
Composite Impedance	Range	LS: 0.1μH-25μH RS: 30mΩ-230 Ω	CL: 30pF-80000pF RS: Consistent with CR mode high grade	CL: Consistent with CR mode high grade
	Resolution	LS: 0.1μH RS: 1 mΩ	CL: 1μF	RS: Consistent with CR mode high grade
LED Test		1μA/0.01-1		
Battery Test	Discharge Time	1s-10000s		
	Resolution	1s		
Current Dynamic	T1&T2	0.020-99.999ms/10ms-9999ms		
	Resolution	1μA/1ms		
	Accuracy	2mA/100ppm		
Current Measurement	Measure Rise Time	10ms(Typical)	20ms(Typical)	20ms(Typical)
	Range, Resolution	Same as current loading		
	Accuracy	0.04%+0.24%FS		
Voltage Measurement	Range, Resolution	Same as voltage loading		
	Accuracy	0.015%+0.015%FS		
Power Measurement	Input Resistance	800Ω(Typical)	1MΩ(Typical)	2MΩ(Typical)
	Range, Resolution	Same as power loading		
	Accuracy	0.1%+0.1%FS+1UF		
Operating Temperature Humidity		0-55℃ 35-90%RH		
Temperature Coefficient		100ppm/℃(Typical)		

Any changes to the above parameter specifications will not be notified separately.