

High Power DC Electronic Load AN23600E(F) Series



Product Introduction

This AN23600E(F) series is a brand-new high-power DC electronic load developed by Ainuo Instruments, with voltage of 150V/600V/1200V and power of 2kW~60kW. This series of electronic loads are mainly used for testing of products in new energy vehicle OBC, power battery, charging pile, power electronics, servo/server power supply, high voltage UPS, photovoltaic, grid energy storage, aerospace and other fields. A new generation of digital controller is adopted, with built-in five modes and seven advanced modes, providing series test to meet the user's programming, automated test and other needs.

This AN23600E(F) series provides a complete series of models, as shown in the table below

	150V	600V	1200V	Height
2kW	AN23602E-150-200(F)	AN23602E-600-140(F)	AN23602E-1200-80(F)	4U
3kW	AN23603E-150-300(F)	AN23603E-600-210(F)	AN23603E-1200-120(F)	4U
4kW	AN23604E-150-400(F)	AN23604E-600-280(F)	AN23604E-1200-160(F)	4U
5kW	AN23605E-150-500(F)	AN23605E-600-350(F)	AN23605E-1200-200(F)	4U
6kW	AN23606E-150-600(F)	AN23606E-600-420(F)	AN23606E-1200-240(F)	4U
8kW	AN23608E-150-800(F)	AN23608E-600-560(F)	AN23608E-1200-320(F)	7U
10kW	AN23610E-150-1000(F)	AN23610E-600-700(F)	AN23610E-1200-400(F)	7U
12kW	AN23612E-150-1200(F)	AN23612E-600-840(F)	AN23612E-1200-480(F)	7U
15kW	AN23615E-150-1500(F)	AN23615E-600-1050(F)	AN23615E-1200-600(F)	10U
18kW	AN23618E-150-1800(F)	AN23618E-600-1260(F)	AN23618E-1200-720(F)	10U
20kW	AN23620E-150-2000(F)	AN23620E-600-1400(F)	AN23620E-1200-800(F)	13U
24kW	AN23624E-150-2400(F)	AN23624E-600-1680(F)	AN23624E-1200-960(F)	13U
30kW	AN23630E-150-2400(F)	AN23630E-600-2100(F)	AN23630E-1200-1200(F)	21U
36kW	AN23636E-150-2400(F)	AN23636E-600-2400(F)	AN23636E-1200-1440(F)	21U
42kW	AN23642E-150-2400(F)	AN23642E-600-2400(F)	AN23642E-1200-1680(F)	27U
48kW	AN23648E-150-2400(F)	AN23648E-600-2400(F)	AN23648E-1200-1920(F)	27U
54kW	AN23654E-150-2400(F)	AN23654E-600-2400(F)	AN23654E-1200-2160(F)	35U
60kW	AN23660E-150-2400(F)	AN23660E-600-2400(F)	AN23660E-1200-2400(F)	35U

Features

- High power density, 4U high for 6kW, 13U high for 24kW; compact, light, convenient;
- Precision measurement, accuracy of voltage 0.015%+0.015%F.S., current 0.04%+0.04%F.S. and power 0.1%+0.1%F.S. (unchanged at high temperature);
- Built-in dynamic loading mode, dynamic frequency up to 50kHz, Vpk+/- test;
- Built-in FLEX mode, to simulate capacitive load, inductive load and composite impedance load;
- Wide range, current range almost twice the traditional high-power load with same capacity;
- Excellent dynamic characteristics, rapid current rise up to 96A/us;
- Built-in constant current (CC), constant voltage (CV), constant resistance (CR), constant power (CP), short circuit simulation, overcurrent protection test, series test and other functions;
- Complete protection, including overcurrent\overvoltage\overtemperature\reverse connection\SENSE protection, etc.;
- Built-in temperature acquisition chip and speed-adjustable fan control;
- Built-in battery mode, suitable for battery integration and timing during discharge test;
- Rich interfaces, standard RS232, optional RS485/LAN/GPIB/CAN and others.

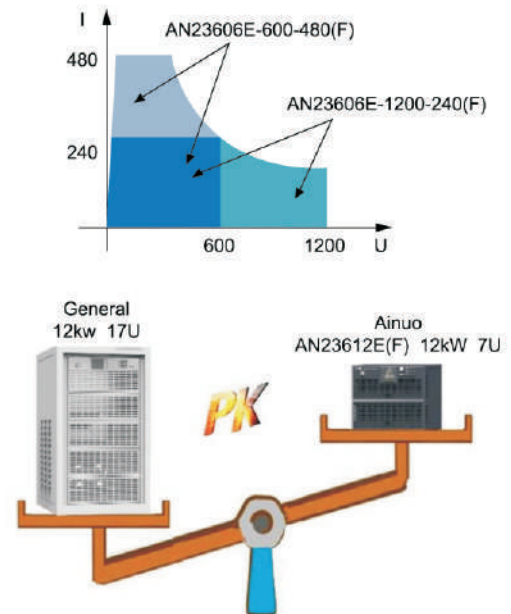
Applications

- DC charging pile/vehicle charger, power electronics test
- Testing of intelligent manufacturing and industrial motors
- Test of automotive electronics, such as fuses, control boxes, etc.
- Test of simulated relay load
- Test of military aerospace power supply
- Test of server power supply, high voltage UPS, communication power supply
- Battery discharge test
- Test of photovoltaic module array, wind power generation dummy load
- Test of simulated energy storage system
- Test of DC power supply and power electronic components



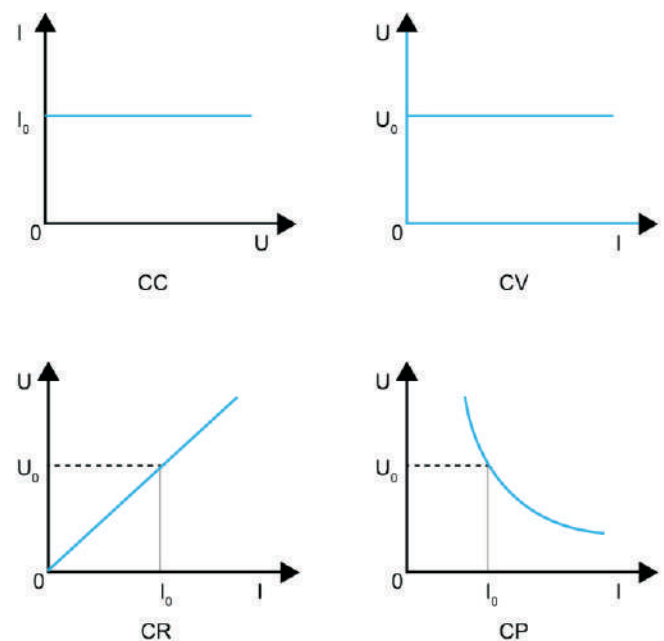
High Power Density, Compact, Wide Voltage

The AN23600E(F) series load has wide range of voltage/current input for various testing of high current and low voltage, or high voltage and low current, featuring high power density, half the volume and one third the weight of traditional electronic loads.



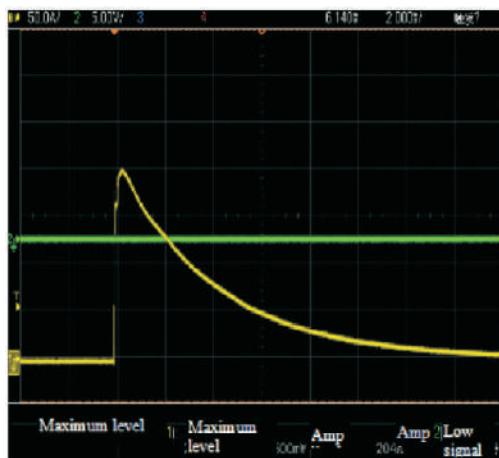
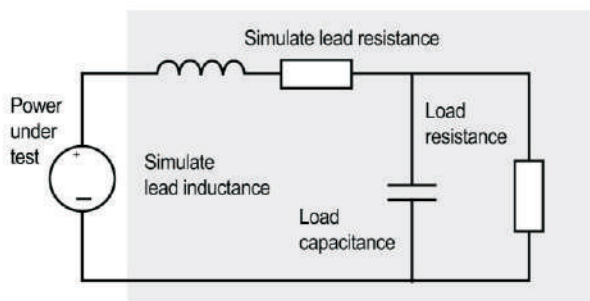
Basic Mode

Built-in constant voltage (CV), constant current (CC), constant resistance (CR), and constant power (CP) modes to meet various testing requirements.



FLEX Mode - Built-in Complex Impedance Network Power-on Mode

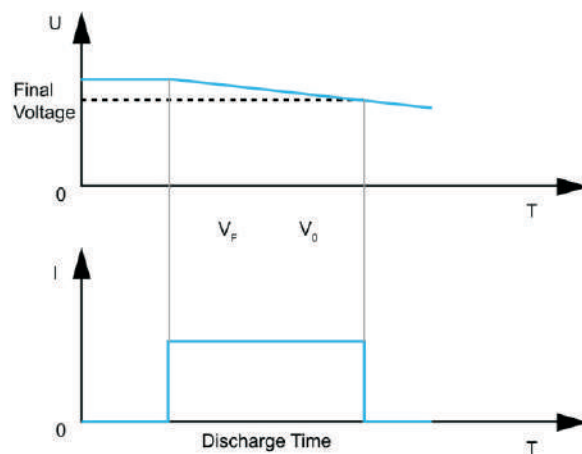
The input filter capacitor in real load will cause huge inrush current at the moment of power-on. The parasitic resistance and inductance of long internal lead will cause further distortion of the loading wave. So its impedance will be equivalent to a complex impedance network. The built-in complex impedance (FLEX) mode of AN23600E(F) series is designed to simulate such loads to test the suitability of the power supply under test. The four test parameters shown in the figure below are decomposed according to the characteristics of real load in this mode. After power-on, the load will load current according to the set impedance network.



Set parameters in FLEX mode
 Simulate lead inductance: 0.1uH~20uH
 Simulate lead resistance: 30mQ~20Q
 Load capacitance: 30uF~50000uF
 Load resistance: Consistent with high-level in CR mode

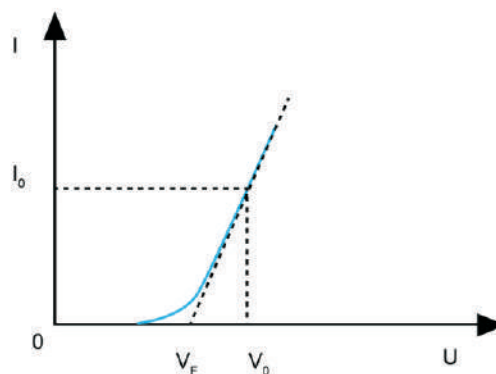
BATY Mode - Dedicated Mode for Battery Test

The AN23600E(F) series load provides three discharge modes for batteries: constant current (CC), constant resistance (CR) and constant power (CP), and can control the loading of the electronic load by setting the voltage threshold and test time (1~100000 seconds) to avoid damage to the battery caused by over-discharge. In addition, it provides discharge level indication. BATY mode is also available for supercapacitors and other similar discharge tests.



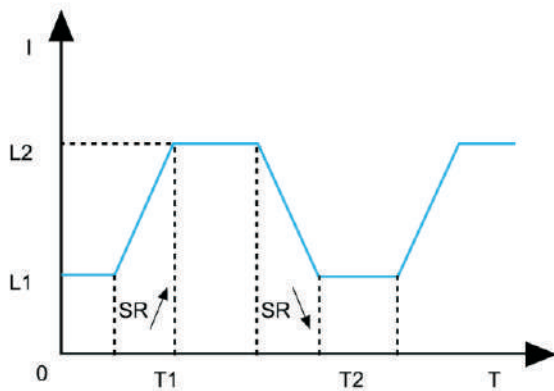
LED Mode - Simulate LED Load Mode

The AN23600E(F) series load has built-in load mode to simulate LED, loading as shown in the below figure to simulate the current of LED 0A before it is turned on and volt-ampere rise after turn on. The electronic load is adopted to simulate loading to avoid problems of light pollution and instability of parameters caused by the LED strips and resistive loads.



CCD Mode - Fast Dynamics and Vpp Test

The AN23600E(F) series load has built-in high-speed dynamic loading test function, and the dynamic change can be up to 50kHz. The user can set the number of repetitions for a period (1~100000), or continuously perform dynamic loading. As shown in the figure below, you can set the current high/low loading value, loading time, rising/falling slopes, etc. While performing dynamic loading, the load also provides peak-to-peak voltage measurement with acquisition frequency of up to 500kHz.

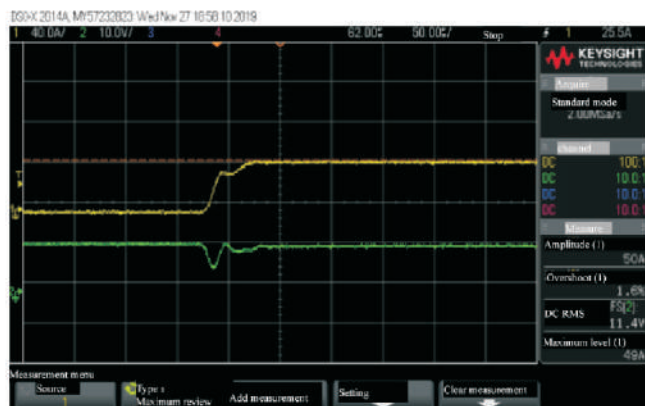


CC Mode - Ultra-fast Loading Speed and Ultra-low Overshoot

The AN23600E(F) series of loads can provide ultra-fast loading.

For example, AN23606E-1200-240(F) can provide 12A/us rising speed. In addition to rapid loading, the built-in digital controller of the load can minimize the overshoot amplitude.

The below figure shows the compare between the current rise wave of AN23600E(F) load and the electronic load of certain brand during loading at full speed.



Current rise wave of AN23600E(F) series at full speed



Current rise wave of certain brand electronic load at full speed

CV Mode - High Performance Controller With Adjustable Loop Speed

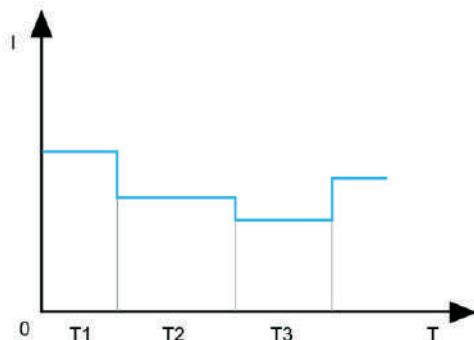
With more applications of constant current (CC) sources, This AN23600E(F) series load has built-in optimized zero compensation controller. While satisfying fast, stable and accurate loading, there are three kinds of loop speed adjustable, expanding the load adaptability. Different from the ordinary integral-type lag control, an obvious advance predictive control link can be seen in the right figure. The bottom is the current wave, and the pre-judgment of the power supply under test is completed first, so that the CV loading process can be completed quickly and stably.



LIST Mode – Series Loading

Up to 8 groups of data can be edited via built-in series test of AN23600E(F) load. 200 steps can be edited for each group, and the execution time (0-100s) can be edited for each step.

Different loading current waves are provided in battery discharge, server, communication power combined load modulation and other occasions, as an effective supplement to dynamic current testing.



High Precision Measurement

This AN23600E(F) series load provides three levels for voltage/current measurements. Taking AN23606E-1200-240(F) as an example, the voltage is 150V/600V/1200V, meeting the needs of low-medium-high voltage; the current is 24A/120A/240A, providing accurate measurements for different applications. High-precision A/D and D/A chips, with accuracy of voltage $0.015\%+0.015\%\text{F.S.}$, current $0.04\%+0.04\%\text{F.S.}$ and power $0.1\%+0.1\%\text{F.S.}$

Instantaneous Overpower Capability

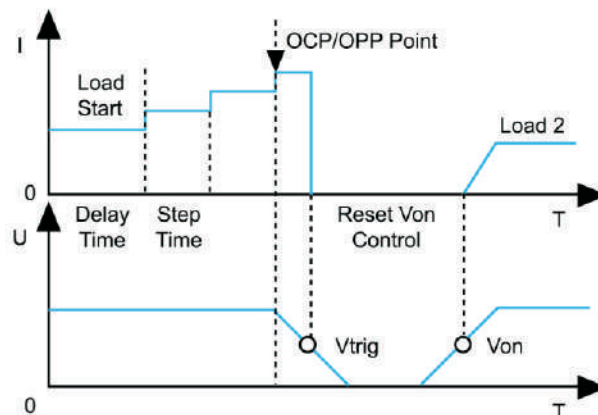
The AN23600E(F) series has instantaneous 2 times overpower loading capacity, so that the load can withstand the loading capacity exceeding the rated power in short time,

Idea selection of impact products.

Users can select models according to the rated power of the power supply or battery instead of the maximum power, low cost, high 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).

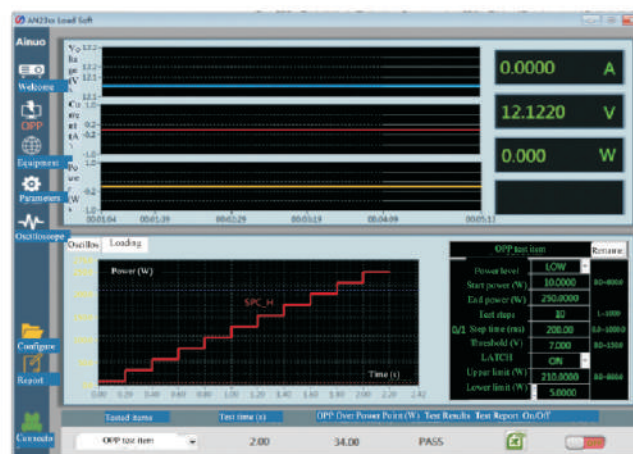


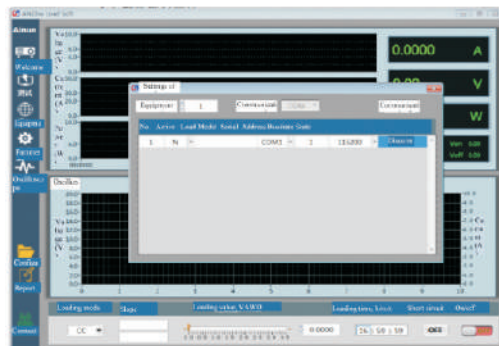
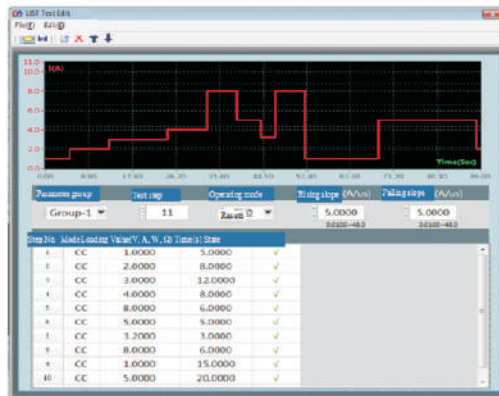
When the load detects that the voltage is less than or equal to the threshold after setting the loading current and the threshold, the loading stops, and the current/power at the moment of protection is displayed on the screen, and the result is judged according to the protection point.

Visual Programming Software

Users can test by using the PC software programming load. It will be troublesome to set the series test (List) via the 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.





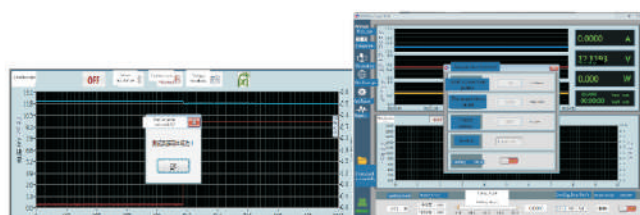
Acquire Data

The user can acquire the instantaneous voltage/current via acquisition of the load and cooperating with the trigger source, and draw a wave of the data points via the host software. The test data can be exported to a excel file.

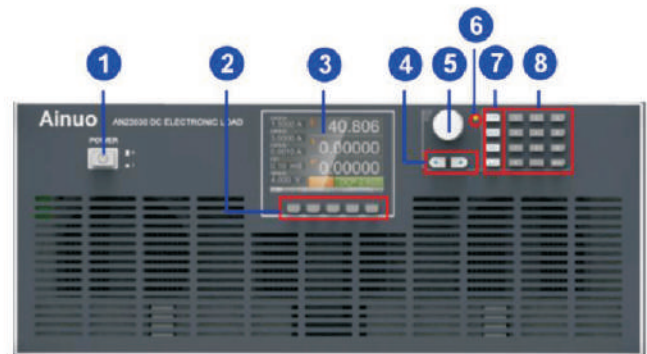
Acquisition time: 1-40 us; resolution: 1 us

Number of acquisition points: 1~1024 (total number)

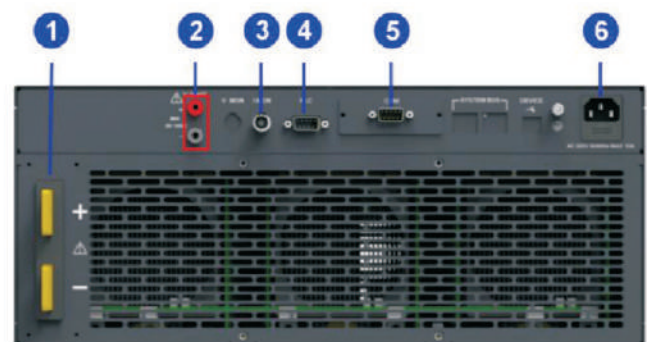
Trigger source: Load on/Load off/TTL/BUS/Manual



Panel



No.	Name	Description
①	Power switch	AC power switch of electronic load host
②	F1-F5 menu	F1~F5, shortcuts
③	Display screen	Display settings and measurement
④	Direction buttons	Left/right keys
⑤	Knob	Move the cursor up/down and adjust parameters
⑥	Tricolor indicator light	Load working LED
⑦	Control buttons	LOAD, MENU, ESC, ENTER
⑧	Number key	Number keys 0-9, (Cancel key)



No.	Name	Description
①	DC load terminal	Loading terminal
②	Vsense terminal	Remote detection power voltage
③	I_Monitor	Loading current wave detection
④	PLC	Various PLC functions (reserved)
⑤	COM	RS232 or RS485 optional
⑥	Power socket	Power input

Specifications

Model		AN23602E -150-200(F)	AN23603E -150-300(F)	AN23604E -150-400(F)	AN23605E -150-500(F)	AN23606E -150-600(F)	AN23608E -150-800(F)
Operating range	Voltage	0-150V					
	Current	0-200A	0-300A	0-400A	0-500A	0-600A	0-800A
	Power	2 kW	3 kW	4 kW	5 kW	6 kW	8 kW
Minimum working voltage		1.8V@200A	1.8V@300A	1.8V@400A	1.8V@500A	1.8V@600A	1.8V@800A
CC loading	Measurement range	20/100/200A	30/150/300A	40/200/400A	50/250/500A	60/300/600A	80/400/800A
	Resolution	0.2/1/2mA	0.2/1/2mA	0.4/2/4mA	0.5/2/5mA	0.5/2/5mA	1/5/10mA
	Accuracy	0.05%+0.05%F.S.					
CV loading	Measurement range	16/80/150V					
	Resolution	0.1/0.5/1mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	15mΩ-150Ω(16V)	10mΩ-100Ω(16V)	7.5mΩ-75Ω(16V)	5mΩ-50Ω(16V)	5mΩ-50Ω(16V)	3.8mΩ-37.5Ω(16V)
		60mΩ-600Ω(80V)	40mΩ-400Ω(80V)	30mΩ-300Ω(80V)	20mΩ-200Ω(80V)	20mΩ-200Ω(80V)	15mΩ-150Ω(80V)
		1.5Ω-3000Ω(150V)	1Ω-2000Ω(150V)	0.75Ω-1500Ω(150V)	0.5Ω-1000Ω(150V)	0.5Ω-1000Ω(150V)	0.375Ω-750Ω(150V)
	Resolution	2mA/V sense	2mA/V sense	4mA/V sense	5mA/V sense	5mA/V sense	10mA/V sense
	Accuracy	Vin/ Rset* (0.2%)+0.2%I.F.S.					
CP loading	Measurement range	200/1000/2000W	300/1500/3000W	400/2000/4000W	500/2500/5000W	600/3000/6000W	800/4000/8000W
	Resolution	5/20/50mW	5/20/50mW	10/50/100mW	10/50/100mW	10/50/100mW	20/100/200mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	0.2mA/μs-2A/μs (20A)	0.2mA/μs-3A/μs (30A)	0.5mA/μs-4A/μs (40A)	0.5mA/μs-5A/μs (50A)	0.5mA/μs-6A/μs (60A)	1mA/μs-8A/μs (80A)
		1mA/μs-7A/μs (100A)	1mA/μs-10.5A/μs (150A)	2mA/μs-14A/μs (200A)	2mA/μs-17.5A/μs (250A)	2mA/μs-21A/μs (300A)	5mA/μs-24A/μs (400A)
		2mA/μs-14A/μs (200A)	2mA/μs-21A/μs (300A)	5mA/μs-28A/μs (400A)	5mA/μs-35A/μs (500A)	5mA/μs-42A/μs (600A)	10mA/μs-48A/μs (800A)
	Resolution	0.2/1/2mA/μs	0.2/1/2mA/μs	0.4/2/4mA/μs	1/5/10mA/μs	0.5/2/5mA/μs	1/5/10 mA/μs
Specification	Outline dimension	426×177 (201 including feet, removable)×600 (W×H×D), mm					426 mm ×400mm ×650 mm (W×H×D)
	Weight	24.5 kg	29.5 kg	29.5 kg	35 kg	35 kg	61 kg

Model		AN23610E -150-1000(F)	AN23612E -150-1200(F)	AN23615E -150-1500(F)	AN23618E -150-1800(F)	AN23620E -150-2000(F)	AN23624E -150-2400(F)
Operating range	Voltage	0-150V					
	Current	0-1000A	0-1200A	0-1500A	0-1800A	0-2000A	0-2400A
	Power	10kW	12kW	15kW	18kW	20kW	24kW
Minimum working voltage		1.8V@1000A	1.8V@1200A	1.8V@1500A	1.8V@1800A	1.8V@2000A	1.8V@2400A
CC loading	Measurement range	100/500/1000A	120/600/1200A	150/750/1500A	180/900/1800A	200/1000/2000A	240/1200/2400A
	Resolution	1/5/10mA	1/5/10mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA
	Accuracy	0.05%+0.05%F.S.					
CV loading	Measurement range	16/80/150V					
	Resolution	0.1/0.5/1mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	2.5mΩ-25Ω(16V)	2.5mΩ-25Ω(16V)	1.7mΩ-16.67Ω(16V)	1.7mΩ-16.67Ω(16V)	1.3mΩ-12.5Ω(16V)	1.3mΩ-12.5Ω(16V)
		10mΩ-100Ω(80V)	10mΩ-100Ω(80V)	6.7mΩ-66.67Ω(80V)	6.7mΩ-66.67Ω(80V)	5mΩ-50Ω(80V)	5mΩ-50Ω(80V)
		0.25Ω-500Ω(150V)	0.25Ω-500Ω(150V)	0.167Ω-333.34Ω(150V)	0.167Ω-333.34Ω(150V)	0.125Ω-250Ω(150V)	0.125Ω-250Ω(150V)
	Resolution	10mA/Vsense	10mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	Vin/ Rset* (0.2%)+0.2%I.F.S.					
CP loading	Measurement range	1000/5000/10000W	1200/6000/12000W	1500/7500/15000W	1800/9000/18000W	2000/10000/20000W	2400/12000/24000W
	Resolution	20/100/200mW	20/100/200mW	40/200/400mW	40/200/400mW	40/200/400mW	100/500/1000mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	1mA/μs-10A/μs (100A)	1mA/μs-12A/μs (120A)	2mA/μs-15A/μs (150A)	2mA/μs-18A/μs (180A)	2mA/μs-20A/μs (200A)	2mA/μs-24A/μs (240A)
		5mA/μs-27.5A/μs (500A)	5mA/μs-30A/μs (600A)	10mA/μs-32A/μs (750A)	10mA/μs-36A/μs (900A)	10mA/μs-40A/μs (1000A)	10mA/μs-48A/μs (1200A)
		10mA/μs-55A/μs (1000A)	10mA/μs-60A/μs (1200A)	20mA/μs-64A/μs (1500A)	20mA/μs-72A/μs (1800A)	20mA/μs-80A/μs (2000A)	20mA/μs-96A/μs (2400A)
	Resolution	1/5/10 mA/μs	1/5/10 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs
Specification	Outline dimension	426 mm ×400 mm ×650 mm (W×H×D)		426 mm×532.5 mm×650 mm (W×H×D)		426 mm ×662 mm ×650 mm (W×H×D)	
	Weight	66.5ka	72ka	92.5ka	98ka	113ka	124ka

Specifications

Model		AN23630E -150-2400(F)	AN23636E -150-2400(F)	AN23642E -150-2400(F)	AN23648E -150-2400(F)	AN23654E -150-2400(F)	AN23660E -150-2400(F)
Operating range	Voltage	0-150V					
	Current	0-2400A	0-2400A	0-2400A	0-2400A	0-2400A	0-2400A
	Power	30kW	36kW	42kW	48kW	54kW	60kW
Minimum working voltage		1.8V@2400A	1.8V@2400A	1.8V@2400A	1.8V@2400A	1.8V@2400A	1.8V@2400A
CC loading	Measurement range	240/1200/2400A	240/1200/2400A	240/1200/2400A	240/1200/2400A	240/1200/2400A	240/1200/2400A
	Resolution	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA
	Accuracy	0.05%+0.05%F.S.					
CV loading	Measurement range	16/80/150V					
	Resolution	0.1/0.5/1mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)	1.3mΩ-12.5Ω(16V) 5mΩ-50Ω(80V) 0.125Ω-250Ω(150V)
	Resolution	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	Vin/Rset*(0.2%)+0.2%IFS.					
CP loading	Measurement range	3000/15000/30000W	3600/18000/36000W	4200/21000/42000W	4800/24000/48000W	5400/27000/54000W	6000/30000/60000W
	Resolution	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	400/2000/4000mW	400/2000/4000mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)	2mA/μs-24A/μs (240A) 10mA/μs-48A/μs (1200A) 20mA/μs-96A/μs (2400A)
	Resolution	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs	2/10/20 mA/μs
	Specification	Outline dimension	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	600 mm×1795 mm ×800 mm (W×H×D)
	Weight	205kg	231kg	272kg	298kg	435kg	469kg

Model		AN23602E -600-140(F)	AN23603E -600-210(F)	AN23604E -600-280(F)	AN23605E -600-350(F)	AN23606E -600-420(F)	AN23608E -600-560(F)
Operating range	Voltage	0-600V					
	Current	0-140A	0-210A	0-280A	0-350A	0-420A	0-560A
	Power	2kW	3kW	4kW	5kW	6kW	8kW
Minimum working voltage		14V@140A	14V@210A	14V@280A	14V@350A	14V@420A	14V@420A
CC loading	Measurement range	14/70/140A	21/105/210A	28/140/280A	35/175/350A	42/210/420A	56/280/560A
	Resolution	0.2/1/2mA	0.2/1/2mA	0.4/2/4mA	0.4/2/4mA	0.4/2/4mA	0.5/2/5mA
	Accuracy	0.05%+0.05%F.S.					
CV loading	Measurement range	80/150/600V					
	Resolution	0.5/1/5mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	0.15Ω-1500Ω(80V)	0.1Ω-1000Ω(80V)	75mΩ-750Ω(80V)	50mΩ-500Ω(80V)	50mΩ-500Ω(80V)	38mΩ-375Ω(80V)
		0.6Ω-6000Ω(150V)	0.4Ω-4000Ω(150V)	300mΩ-3000Ω(150V)	200mΩ-2000Ω(150V)	200mΩ-2000Ω(150V)	150mΩ-1.5kΩ(150V)
		6Ω-12000Ω(600V)	4Ω-8000Ω(600V)	3Ω-6000Ω(600V)	2Ω-4000Ω(600V)	2Ω-4000Ω(600V)	1.5Ω-3kΩ(600V)
	Resolution	2mA/V/sense	2mA/V/sense	4mA/V/sense	4mA/V/sense	4mA/V/sense	5mA/V/sense
	Accuracy	Vin/Rset*(0.2%)+0.2%I.F.S.					
CP loading	Measurement range	200/1000/2000W	300/1500/3000W	400/2000/4000W	500/2500/5000W	600/3000/6000W	800/4000/8000W
	Resolution	5/20/50mW	5/20/50mW	10/50/100mW	10/50/100mW	10/50/100mW	20/100/200mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	0.2mA/μs-0.6A/μs (14A)	0.2mA/μs-0.9A/μs (21A)	0.4mA/μs-1.2A/μs (28A)	0.4mA/μs-1.5A/μs (35A)	0.4mA/μs-1.8A/μs (42A)	0.5mA/μs-1.8A/μs (56A)
		1mA/μs-3A/μs (70A)	1mA/μs-4.5A/μs (105A)	2mA/μs-6A/μs (140A)	2mA/μs-7.5A/μs (175A)	2mA/μs-9A/μs (210A)	2mA/μs-9A/μs (280A)
		2mA/μs-6A/μs (140A)	2mA/μs-9A/μs (210A)	4mA/μs-12A/μs (280A)	4mA/μs-15A/μs (350A)	4mA/μs-18A/μs (420A)	5mA/μs-18A/μs (560A)
	Resolution	0.2/1/2mA/μs	0.2/1/2mA/μs	0.4/2/4mA/μs	0.4/2/4mA/μs	0.4/2/4mA/μs	0.5/2/5mA/μs
Specification	Outline dimension	426mm×177(201 including feet, removable)mm×600mm (W×H×D)					426 mm ×400 mm ×650 mm (W×H×D)
	Weight	24.5kg	29.5kg	29.5kg	35kg	35kg	61kg

Specifications

Model		AN23610E -600-700(F)	AN23612E -600-840(F)	AN23615E -600-1050(F)	AN23618E -600-1260(F)	AN23620E -600-1400(F)	AN23624E -600-1680(F)
Operating range	Voltage	0-600V					
	Current	0-700A	0-840A	0-1050A	0-1260A	0-1400A	0-1680A
	Power	10kW	12kW	15kW	18kW	20kW	24kW
Minimum working voltage		14V@700A	14V@840A	14V@1050A	14V@1260A	14V@1400A	14V@1400A
CC loading	Measurement range	70/350/700A	84/420/840A	105/525/1050A	128/630/1260A	140/700/1400A	168/840/1680A
	Resolution	0.5/2.5/5mA	1/5/10mA	1/5/10mA	1/5/10mA	2/10/20mA	2/10/20mA
	Accuracy	0.05%+0.05%F.S.					
CV loading	Measurement range	80/150/600V					
	Resolution	0.5/1/5mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	25mΩ-250Ω(80V)	25mΩ-250Ω(80V)	17mΩ-166.67Ω(80V)	17mΩ-166.67Ω(80V)	13mΩ-125Ω(80V)	13mΩ-125Ω(80V)
		0.1Ω-1000Ω(150V)	0.1Ω-1000Ω(150V)	67Ω-666.67Ω(150V)	67Ω-666.67Ω(150V)	50mΩ-500Ω(150V)	50mΩ-500Ω(150V)
		1Ω-2000Ω(600V)	1Ω-2000Ω(600V)	0.67Ω-1333.34Ω(600V)	0.67Ω-1333.34Ω(600V)	0.5Ω-1000Ω(600V)	0.5Ω-1000Ω(600V)
	Resolution	5mA/Vsense	10mA/Vsense	10mA/Vsense	10mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	Vin/ Rset* (0.2%)+0.2%I.F.S.					
CP loading	Measurement range	1000/5000/10000W	1200/6000/12000W	1500/7500/15000W	1800/9000/18000W	2000/10000/20000W	2400/12000/24000W
	Resolution	20/100/200mW	20/100/200mW	40/200/400mW	40/200/400mW	100/500/1000mW	100/500/1000mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	0.5mA/μs-2.1A/μs (70A)	1mA/μs-2.4A/μs (84A)	1mA/μs-2.7A/μs (105A)	1mA/μs-3A/μs (105A)	2mA/μs-3.3A/μs (140A)	2mA/μs-3.6A/μs (168A)
		2.5mA/μs-10.5A/μs (350A)	5mA/μs-12A/μs (420A)	5mA/μs-13.5A/μs (525A)	5mA/μs-15A/μs (525A)	10mA/μs-16.5A/μs (700A)	10mA/μs-18A/μs (840A)
		5mA/μs-21A/μs (700A)	10mA/μs-24A/μs (840A)	10mA/μs-27A/μs (1050A)	10mA/μs-30A/μs (1050A)	20mA/μs-33A/μs (1400A)	20mA/μs-36A/μs (1680A)
	Resolution	0.5/2.5/5mA/μs	1/5/10mA/μs	1/5/10mA/μs	1/5/10mA/μs	2/10/20mA/μs	2/10/20mA/μs
Specification	Outline dimension	426 mm ×400 mm ×650 mm (W×H×D)		426 mm×532.5 mm×650 mm (W×H×D)		426 mm ×665 mm ×650 mm (W×H×D)	
	Weight	66.5kg	72kg	92.5kg	98kg	113kg	124kg

Model	AN23630E -600-2100(F)	AN23636E -600-2400(F)	AN23642E -600-2400(F)	AN23648E -600-2400(F)	AN23654E -600-2400(F)	AN23660E -600-2400(F)
Operating range	Voltage	0-600V				
	Current	0-2100A	0-2400A	0-2400A	0-2400A	0-2400A
	Power	30kW	36kW	42kW	48kW	54kW
Minimum working voltage	14V@2100A	14V@2400A	14V@2400A	14V@2400A	14V@2400A	14V@2400A
CC loading	Measurement range	210/1050/2100A	240/1200/2400A	240/1200/2400A	240/1200/2400A	240/1200/2400A
	Resolution	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA
	Accuracy	0.05%+0.05%F.S.				
CV loading	Measurement range	80/150/600V				
	Resolution	0.5/1/5mV				
	Accuracy	0.025%+0.025%F.S.				
CR loading	Measurement range	10mΩ-100Ω(80V) 40mΩ-400Ω(150V) 0.4Ω-800Ω(600V)	9mΩ-87.5Ω(80V) 4mΩ-350Ω(150V) 0.35Ω-700Ω(600V)	9mΩ-87.5Ω(80V) 4mΩ-350Ω(150V) 0.35Ω-700Ω(600V)	9mΩ-87.5Ω(80V) 4mΩ-350Ω(150V) 0.35Ω-700Ω(600V)	9mΩ-87.5Ω(80V) 4mΩ-350Ω(150V) 0.35Ω-700Ω(600V)
	Resolution	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	Vin/Rset* (0.2%)+0.2%I.F.S.				
CP loading	Measurement range	3000/15000/30000W	3600/18000/36000W	4200/21000/42000W	4800/24000/48000W	5400/27000/54000W
	Resolution	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW
	Accuracy	0.2%+0.2%F.S.				
Current change rate	Setting range	2mA/μs-3.6A/μs (210A) 10mA/μs-18A/μs (1050A) 20mA/μs-36A/μs (2100A)	2mA/μs-3.6A/μs (240A) 10mA/μs-18A/μs (1200A) 20mA/μs-36A/μs (2400A)	2mA/μs-3.6A/μs (240A) 10mA/μs-18A/μs (1200A) 20mA/μs-36A/μs (2400A)	2mA/μs-3.6A/μs (240A) 10mA/μs-18A/μs (1200A) 20mA/μs-36A/μs (2400A)	2mA/μs-3.6A/μs (240A) 10mA/μs-18A/μs (1200A) 20mA/μs-36A/μs (2400A)
	Resolution	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs
Specification	Outline dimension	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	600 mm ×1795mm ×800 mm (W×H×D)
	Weight	205kg	231kg	272kg	298kg	435kg

Specifications

Model		AN23602E -1200-80(F)	AN23603E -1200-120(F)	AN23604E -1200-160(F)	AN23605E -1200-200(F)	AN23606E -1200-240(F)	AN23608E -1200-320(F)
Operating range	Voltage	0-1200V					
	Current	0-80A	0-120A	0-160A	0-200A	0-240A	0-320A
	Power	2kW	3kW	4kW	5kW	6kW	8kW
Minimum working voltage		20V@80A	20V@120A	20V@160A	20V@200A	20V@240A	20V@320A
CC loading	Measurement range	8/40/80A	12/60/120A	16/80/160A	20/100/200A	24/120/240A	32/160/320A
	Resolution	0.1/0.5/1mA	0.1/0.5/1mA	0.2/1/2mA	0.2/1/2mA	0.2/1/2mA	0.4/2/4mA
	Accuracy	0.04%+0.06%F.S.					
CV loading	Measurement range	150/600/1200V					
	Resolution	1/5/10mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	0.3Ω-3kΩ(150V)	0.2Ω-2kΩ(150V)	0.15Ω-1.5kΩ(150V)	0.1Ω-1kΩ(150V)	0.1Ω-1kΩ(150V)	75mΩ-0.75kΩ(150V)
		1.2Ω-12kΩ(600V)	0.8Ω-8kΩ(600V)	0.6Ω-6kΩ(600V)	0.4Ω-4kΩ(600V)	0.4Ω-4kΩ(600V)	0.3Ω-3kΩ(600V)
		30Ω-60kΩ(1200V)	20Ω-40kΩ(1200V)	15Ω-30kΩ(1200V)	10Ω-20kΩ(1200V)	10Ω-20kΩ(1200V)	7.5Ω-15kΩ(1200V)
	Resolution	1mA/Vsense	1mA/Vsense	2mA/Vsense	2mA/Vsense	2mA/Vsense	4mA/Vsense
	Accuracy	Vin/Rset*(0.2%)+0.2%IFS.					
CP loading	Measurement range	200/1000/2000W	300/1500/3000W	400/2000/4000W	500/2500/5000W	600/3000/6000W	800/4000/8000W
	Resolution	5/20/50mW	5/20/50mW	10/50/100mW	10/50/100mW	10/50/100mW	20/100/200mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	0.1mA/μs-0.4A/μs (8A)	0.1mA/μs-0.6A/μs (12A)	0.2mA/μs-0.8A/μs (16A)	0.2mA/μs-1A/μs (20A)	0.2mA/μs-1.2A/μs (24A)	0.4mA/μs-1.2A/μs (32A)
		0.5mA/μs-2A/μs (40A)	0.5mA/μs-3A/μs (60A)	1mA/μs-4A/μs (80A)	1mA/μs-5A/μs (100A)	1mA/μs-6A/μs (120A)	2mA/μs-6A/μs (160A)
		1mA/μs-4A/μs (80A)	1mA/μs-6A/μs (120A)	2mA/μs-8A/μs (160A)	2mA/μs-10A/μs (200A)	2mA/μs-12A/μs (240A)	4mA/μs-12A/μs (320A)
	Resolution	0.1/0.5/1mA/μs	0.1/0.5/1mA/μs	0.2/1/2mA/μs	0.2/1/2mA/μs	0.2/1/2mA/μs	0.4/2/4mA/μs
Specification	Outline dimension	426mm×177mm×600mm (W×H×D)					426 mm ×400 mm ×650 mm (W×H×D)
	Weight	24.5kg	29.5kg	29.5kg	35kg	35kg	61kg

Model		AN23610E -1200-400(F)	AN23612E -1200-480(F)	AN23615E -1200-600(F)	AN23618E -1200-720(F)	AN23620E -1200-800(F)	AN23624E -1200-960(F)
Operating range	Voltage	0-1200V					
	Current	0-400A	0-480A	0-600A	0-720A	0-800A	0-960A
	Power	10kW	12kW	15kW	18kW	20kW	24kW
Minimum working voltage		20V@400A	20V@480A	20V@600A	20V@720A	20V@800A	20V@960A
CC loading	Measurement range	40/200/400A	48/240/480A	60/300/600A	72/360/720A	80/400/800A	96/480/960A
	Resolution	0.4/2/4mA	0.5/2/5mA	0.5/2/5mA	0.5/2/5mA	1/5/10mA	1/5/10mA
	Accuracy	0.04%+0.06%F.S.					
CV loading	Measurement range	150/600/1200V					
	Resolution	1/5/10mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	50mΩ-0.5kΩ(150V)	50mΩ-0.5kΩ(150V)	34mΩ-0.34kΩ(150V)	34mΩ-0.34kΩ(150V)	25mΩ-0.25kΩ(150V)	25mΩ-0.25kΩ(150V)
		0.2Ω-2kΩ(600V)	0.2Ω-2kΩ(600V)	0.14Ω-1.34kΩ(600V)	0.14Ω-1.34kΩ(600V)	0.1Ω-1kΩ(600V)	0.1Ω-1kΩ(600V)
		5Ω-10kΩ(1200V)	5Ω-10kΩ(1200V)	3.34Ω-6.67kΩ(1200V)	3.34Ω-6.67kΩ(1200V)	2.5Ω-5kΩ(1200V)	2.5Ω-5kΩ(1200V)
	Resolution	4mA/Vsense	5mA/Vsense	5mA/Vsense	5mA/Vsense	10mA/Vsense	10mA/Vsense
	Accuracy	Vin/Rset*(0.2%)+0.2%I.F.S.					
CP loading	Measurement range	1000/5000/10000W	1200/6000/12000W	1500/7500/15000W	1800/9000/18000W	2000/10000/20000W	2400/12000/24000W
	Resolution	20/100/200mW	20/100/200mW	40/200/400mW	40/200/400mW	100/500/1000mW	100/500/1000mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	0.4mA/μs-1.4A/μs (40A)	0.4mA/μs-1.6A/μs (48A)	0.5mA/μs-1.8A/μs (60A)	0.5mA/μs-2A/μs (72A)	1mA/μs-2.2A/μs (80A)	1mA/μs-2.4A/μs (96A)
		2mA/μs-7A/μs (200A)	2mA/μs-8A/μs (240A)	2mA/μs-9A/μs (300A)	2mA/μs-10A/μs (360A)	5mA/μs-11A/μs (400A)	5mA/μs-12A/μs (480A)
		4mA/μs-14A/μs (400A)	4mA/μs-16A/μs (480A)	5mA/μs-18A/μs (600A)	5mA/μs-20A/μs (720A)	10mA/μs-22A/μs (800A)	10mA/μs-24A/μs (960A)
	Resolution	0.4/2/4mA/μs	0.4/2/4mA/μs	0.5/2/5mA/μs	0.5/2/5mA/μs	1/5/10mA/μs	1/5/10mA/μs
Specification	Outline dimension	426 mm ×400 mm ×650 mm (W×H×D)		426 mm ×532.5 mm ×650 mm (W×H×D)		426 mm ×665 mm ×650 mm (W×H×D)	
	Weight	66.5kg	72kg	92.5kg	98kg	113kg	124kg

Specifications

Model		AN23630E -1200-1200(F)	AN23636E -1200-1440(F)	AN23642E -1200-1680(F)	AN23648E -1200-1920(F)	AN23654E -1200-2160(F)	AN23660E -1200-2400(F)
Operating range	Voltage	0-1200V					
	Current	0-1200A	0-1440A	0-1680A	0-1920A	0-2160A	0-2400A
	Power	30kW	36kW	42kW	48kW	54kW	60kW
Minimum working voltage		20V@1200A	20V@1440A	20V@1680A	20V@1920A	20V@2160A	20V@2400A
CC loading	Measurement range	120/600/1200A	144/720/1440A	168/840/1680A	192/960/1920A	216/1080/2160A	240/1200/2400A
	Resolution	1/5/10mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA	2/10/20mA
	Accuracy	0.04%+0.06%F.S.					
CV loading	Measurement range	150/600/1200V					
	Resolution	1/5/10mV					
	Accuracy	0.025%+0.025%F.S.					
CR loading	Measurement range	20mΩ-0.2kΩ(150V)	17mΩ-0.17kΩ(150V)	14mΩ-0.14kΩ(150V)	13mΩ-0.13kΩ(150V)	11mΩ-0.11kΩ(150V)	10mΩ-0.1kΩ(150V)
		80mΩ-0.8kΩ(600V)	67mΩ-0.67kΩ(600V)	57mΩ-0.57kΩ(600V)	50mΩ-0.5kΩ(600V)	44mΩ-0.44kΩ(600V)	40mΩ-0.4kΩ(600V)
		2Ω-4kΩ(1200V)	1.67Ω-3.33kΩ(1200V)	1.43Ω-2.86kΩ(1200V)	1.25Ω-2.5kΩ(1200V)	1.11Ω-2.22kΩ(1200V)	1Ω-2kΩ(1200V)
	Resolution	10mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense	20mA/Vsense
	Accuracy	Vin/ Rset* (0.2%)+0.2%I.F.S.					
CP loading	Measurement range	3000/15000/30000W	3600/18000/36000W	4200/21000/42000W	4800/24000/48000W	5400/27000/54000W	6000/30000/60000W
	Resolution	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	200/1000/2000mW	400/2000/4000mW	400/2000/4000mW
	Accuracy	0.2%+0.2%F.S.					
Current change rate	Setting range	1mA/μs-2.4A/μs (120A)	2mA/μs-2.4A/μs (144A)	2mA/μs-2.4A/μs (168A)	2mA/μs-2.4A/μs (192A)	2mA/μs-2.4A/μs (216A)	2mA/μs-2.4A/μs (240A)
		5mA/μs-12A/μs (600A)	10mA/μs-12A/μs (720A)	10mA/μs-12A/μs (840A)	10mA/μs-12A/μs (960A)	10mA/μs-12A/μs (1080A)	10mA/μs-12A/μs (1200A)
		10mA/μs-24A/μs (1200A)	20mA/μs-24A/μs (1440A)	20mA/μs-24A/μs (1680A)	20mA/μs-24A/μs (1920A)	20mA/μs-24A/μs (2160A)	20mA/μs-24A/μs (2400A)
	Resolution	1/5/10mA/μs	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs	2/10/20mA/μs
Specification	Outline dimension	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1100mm ×680 mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	530 mm×1365mm ×680mm (W×H×D)	600 mm ×1795mm ×800 mm (W×H×D)	600 mm ×1795mm ×800 mm (W×H×D)
	Weight	205kg	231kg	272kg	298kg	435kg	469kg

		General parameters		
Voltage		150 V	600 V	1200 V
Composite impedance	Measurement range	LS: 0.1uH~20uH RS: 30mΩ~20Ω CL: 30uF~50000uF RL: Same as CR mode high range		
	Resolution	LS: 0.1uH RS: 1 mΩ CL: 1uF RL: Same as CR mode high range		
LED test	Measurement range	coeff: 0.01~1		
Battery test	Discharging time	1s~100000s		
	Resolution	1s		
Current dynamics	T1&T2	0.020~99.999ms/100ms~99999ms		
	Resolution	2us/1ms		
	Accuracy	2us+100ppm		
	Minimum rise time	100us(Typical)		
Current measurement	Range/resolution	Same as CC loading		
	Accuracy	Same as CC loading		
Voltage measurement	Range/resolution	Same as CV loading		
	Accuracy	0.015%+0.015%F.S.		
	Input resistance	800kΩ (Typical)	1MΩ (Typical)	2MΩ (Typical)
Power measurement	Range/resolution	Same as CP loading		
	Accuracy	0.1%+0.1%I.F.S.*U.F.S.		
Working temperature, humidity		0 ~ 40 ℃, 20-90%RH		
Temperature coefficient		100ppm/℃ (Typical)		