4 SERIES MODULAR DC LOADS

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Key features:

- Max. Power up to 400W per Module
- Wide Voltage Range, 0 - 500 Vdc
- Max. Current Range 80 Adc in continuous and 180A in TURBO mode
- Single Load, Dual Load and LED Load Modules Available
- Up to 8 Load Inputs per Mainframe
- Parallel Modules to 1200W for High Power Applications
- Synchronized Operation of Multiple Loads
- Operating Modes: CC, CP, CR, CV, CC+CV, CP+CV and LED
- Built-in Short Circuit Test
- Built-in Power Supply Over Current Protection Test Mode
- Built-in Power Supply Over Power Protection Test Mode
- Static and Dynamic CC Modes
- Fast Current Slew Rates
- 1, 2 or 4 slot Mainframes for up to eight Load Channels
- Available Interface Options are USB, RS232, GPIB and LAN

Model 42L0860, Dual Load Module

OVERVIEW

The ADAPTIVE POWER 4 Series of Programmable DC Electronic Load Modules are ideally suited for testing multiple output AC/DC power supplies, DC/DC converters, battery chargers and other power products.

Target applications for these loads are research & development, production test, incoming inspection, quality control and service.

The high power density of the 4 Series allows up to 8 loads to be installed in a single 19" wide rack-mount mainframe. For lesser demands, mainframes with two slots or a single slot are available as well.

The 4 Series consists of a total of 12 different modules types providing a wide variation of possible voltage, current, power and feature choices. Starting at 75 Watt and ranging to 300 Watt per module, all modules offer dual range capability for optimal accuracy and resolution. Voltage ranges start at 60Vdc and extend up to 500Vdc.

LED LOAD SIMULATION

For LED power supply testing, the 41D and 42D modules offer single or dual channel LED simulation with support for PWM dimming control.

Synchronized operation of loads allows multichannel loads to be configured easily. Easy to read LCD displays show settings and read back data at a quick glance. Available remote control interfaces facilitate integration into automated power supply test systems.

All 4 Series modules provide protection against over-voltage (OV), over-current, OC), over-power (OP) and over-temperature (OT) to safeguard the loads from any damage.

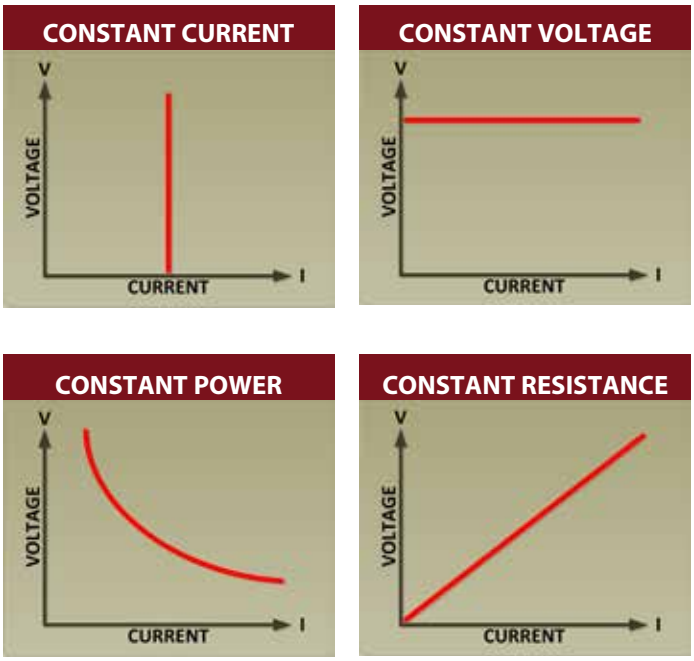
The 4 Series offers excellent performance and durability at an affordable price point.

GPIB RS232 USB LAN

OPERATING MODES

All 4 Series load modules support several modes of operation to accommodate a wide range of test requirements. Voltage sources like AC/DC power supplies are best tested using Constant Current (CC) mode. Battery chargers on the other hand can be tested using an E-load in Constant Voltage mode.

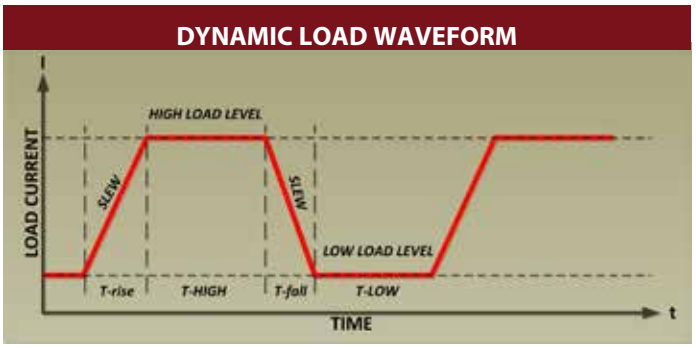
The available operating modes are Constant Current, Constant Voltage, Constant Power and Constant Resistance. A graphical representation of these modes of operation is shown here.



STATIC & DYNAMIC MODES

The demands put on power supplies to support increasingly complex electronics systems continue to escalate. It is no longer sufficient to test power supplies for static load conditions. Instead, dynamic load conditions requiring rapid changes in current demanded from the power supply need to be evaluated and tested. The 4 Series Load modules serve this purpose by offering high speed programmable dynamic load control programmability.

The diagram below illustrates the variable load current slew rates and dwell times that can be programmed on the 4 Series loads.



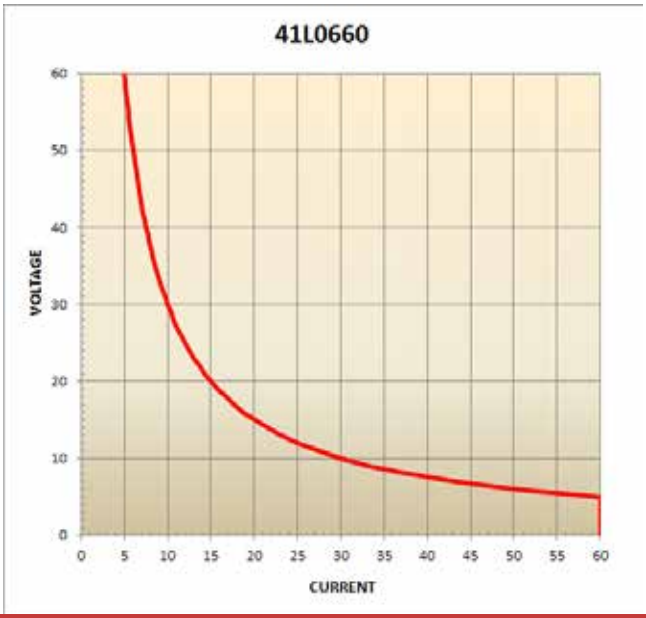
Sequences of variable slew rates and test levels can be stored in non-volatile memory for recall during dynamic transient load test execution. This makes it possible to simulate real-world demanding load conditions on power supplies driving modern electronics. With current slew rates ranging up to several Amps per microsecond and dwell times down to 50 microseconds, thorough transient stability testing of power supply designs is possible. Advanced remote sense and control feedback loops ensure stable and repeatable testing with little or no distortion during load transitions.

FLEXIBLE INPUT CAPABILITIES

4 Series load modules are designed to accommodate a wide range of voltage and current input combinations within their maximum power capability. This allows the same load modules to be used for higher voltage and low current requirements as well as low voltage higher current applications. A typical V-I operating curve is shown on the right for load model 41L0660. Bounded by the maximum voltage of 60Vdc and maximum current of 60A, the input range follows a 300W power curve as shown.

Each load module continuously tracks its input voltage current and power and safeguards against any operation outside of its operating limits.

This flexible operating range allows the same load module to be used for a wide range of EUTs and provides great flexibility in configuring high channel count load test systems.



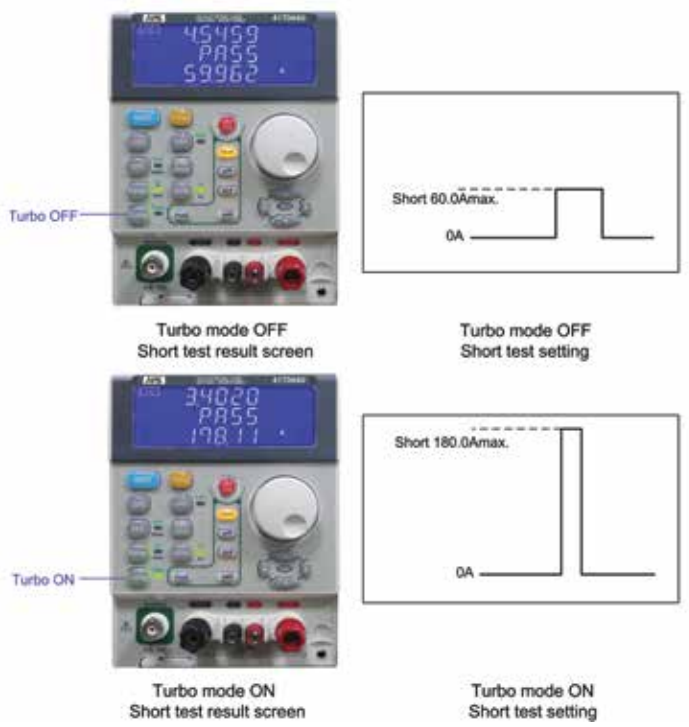
41T MODELS SPECIAL FEATURES

The 41T Series modular DC loads offer a number of advanced features and functions, including **TURBO** boost mode. TURBO mode allows three to four times the maximum rated load current to be absorbed by the load for short periods of time. This mode is perfect for testing protection functions of power supplies such as over-current and over power protection. The same TURBO mode supports testing of current protection devices like Fuses and PTC's without having to use an over-sided load.

41T Modular loads are available in power levels of 75W, 150W, 300W or 400W per module.

Other special test modes offered by the 41T Series are:

- Battery Discharge Test
- Lithium Battery Management System (BMS) Test
- Fuse, Breaker, PTC Specification Test
- MPPT Test for Solar Panels



Short Circuit Test in normal mode vs. TURBO mode

LED SIMULATION

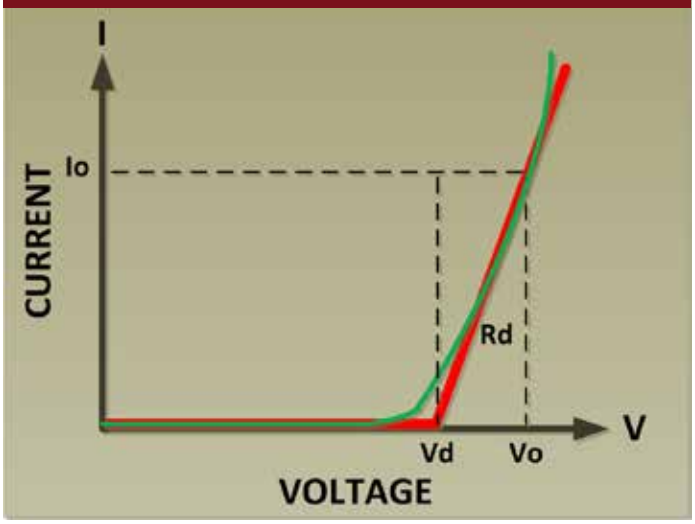
Significant advances are being made in solid state lighting technologies that promise greatly reduced worldwide power consumption as a result of using light emitting diodes instead of incandescent light bulbs. However, the electrical behavior of LEDs is considerably different from that of a light bulb, which can be viewed as a resistive load. Consequently, testing LED driver designs using CR or even CV mode is typically inadequate. While it is possible to use actual LEDs to test such products, given the variety of LEDs that exist, this is not very practical for either development or production test.

The 41D and 42D single and dual channel LED load simulator modules available as part of the 4 Series modular load family address this unique requirement in an effective way.

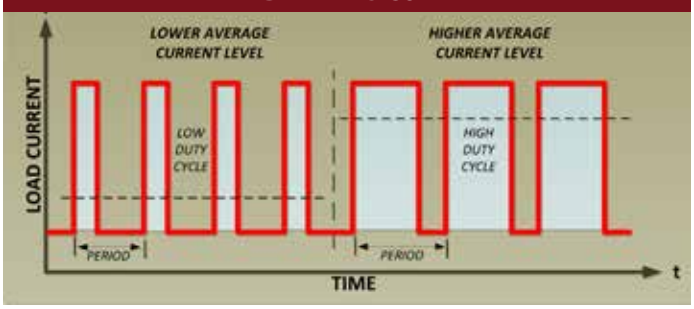
When LED mode of operation is selected, the load will simulate the forward bias V-I characteristic of an LED or a string of LEDs, which is very different from that of a resistor. Values for the LED driver's output Current (Io) and Voltage (Vo) as well as the LEDs forward Voltage (Vd) and Resistance (Rd) can be programmed on the load.

A built in ***dimming control*** circuit with a DC to 1KHz frequency range and 1% to 99% duty cycle is included with each LED Load module. Also available is an optional external shorting relay controlled by the shorting output of the LED load. This option allows zero ohm shorts to be applied.

LED V-I CURVE



PWM DIMMING CURRENT



AVAILABLE OPTIONS

Current Waveform Generator

The Current Waveform Generator plug-in module for its electronic DC loads adds arbitrary current waveform programming functionality. With this option and its accompanying current waveform editor Windows software, you can create an infinite number of custom current waveforms to simulate a wide range of real-world load conditions.

See the CWG Option data sheet for full details.

Device Quick Charger Tester

The Quick Charger Tester option (Opt QCT) is a single channel, quick charge controller to meet the needs of R & D development, testing and verification of modern fast chargers for mobile devices using a variety of charging protocols. The QCT controller can simulate fast charge protocol signals for mobile phones, tables and notebook computers for a wide variety of fast charging devices to support rapid testing and verification of the device charger.

Supported Charging Protocols are:
QC2.0, QC3.0, PE+, PE+2.0, USB PD2.0

See the QCT Option data sheet for full details.

MAINFRAMES

44M01 Mainframe

44M02 Mainframe

44M04 Mainframe

44MBP Filler Panel

The 44M04 Mainframe provides the necessary bias supplies and air cooling to the load modules installed. It also isolates modules from each other so each load is floating and can be used to test multi-output power supplies that are not referenced to a single common.

Mainframes are available with either one, two or four slot positions accommodating up to 8 independent load channels and 1200 Watts of power dissipation. Common controls on the mainframe allow synchronous operation of 2 or more loads and store up to 150 setting configurations. A filler panel is available to cover up any empty slot position.

The single slot 44M01 and dual slot 44M02 mainframe are ideally suited for bench operation while the 44M04 four slot mainframe can be used on the bench or installed in a 19" cabinet. Rack ears and handles are including for rack mount use. All mainframes have tilt stands for optimal viewing angles during bench use.

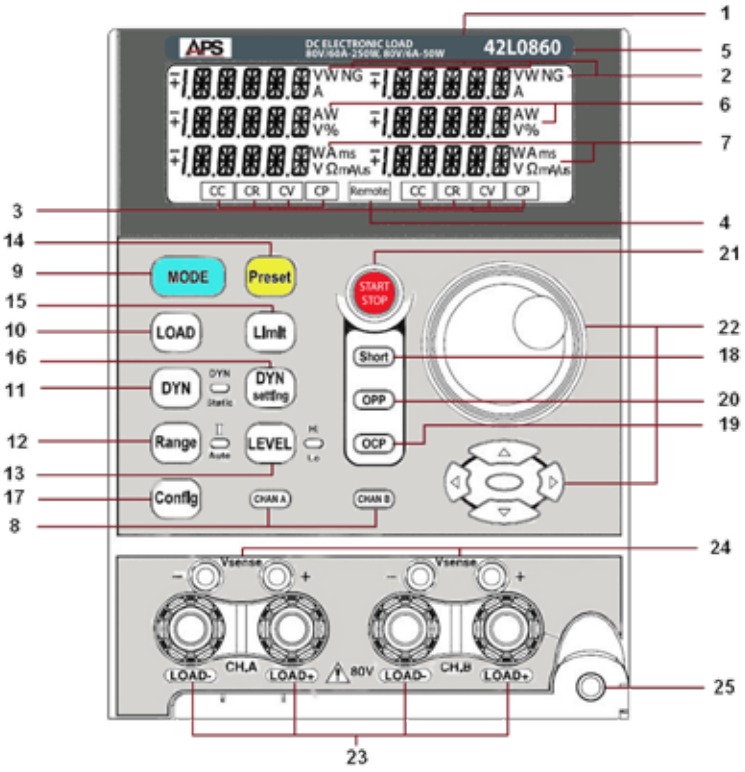
The "T" version of these mainframes is required to support the 41T Series loads. Other load modules can be used in either normal or T version of the mainframe.

Mainframe	44M01/44M01T	44M02/44M02T	44M04/44M04T
No. of Slots	1	2	4
Supports	41L0630, 41L0660, 41L2512, 41:5012, 41L0616 42L0860, 42L0824, 42L0803 41D3002, 41D1020, 41D5002, 42D5003		
Max. Power	300W	600W	1200W
AC Input	100-115Vac ±10% or 200-230Vac ±10%		
Frequency	50 / 60 Hz ±3Hz		
Power (max.)	40W	60W	150W
Dimensions (HxWxD)	177x160x452mm 7.0x6.3x17.8"	177x269x452mm 7.0x10.6x17.8"	177x440x445mm 7.0x17.3x17.5"
Weight	5.5 kg / 12.2 lbs	7.5 kg / 16.5 lbs	9.3 kg / 20.5 lbs
Shipping: - size	13x12x24"	13x16x24"	13x23x24"
- weight	24 lbs incl one 41L Load	31 lbs incl two 41L Loads	52 lbs incl four 41L Loads

LOAD MODULE FRONT PANEL OPERATION

Each load module has its own front panel keypad, rotary shuttle and white LED back-lit LCD display for easy of operation. Dual channel load modules have individual displays for channels A and B. Sample shown below is for Model 42L0860.

1. Model Number and ranges
2. Go/NoGo indicator illuminates if upper or lower limit settings are exceeded.
3. Operating Mode Indicators
4. REMOTE state indicator
5. Multi-purpose 5 digit display - Voltage
6. Multi-purpose 5 digit display - Current
7. Multi-purpose 5 digit display - Power
8. CHAN A or B Control Selection
9. MODE toggle buttons
10. LOAD ON/OFF button and indicator
11. DYNAMIC mode button and indicator
12. High or Low Range Selection



13. High or Low Load Setting Selection
14. Preset Mode ON/OFF
15. Limit Setup Menu
16. DYNAMIC mode settings
17. Configuration Menu
18. Short Circuit Test key and indicator
19. OCP (Over Current Protection) Test key
20. OPP (Over Power Protection) Test key
21. SHORT, OCP & OPP Start/Stop
22. Shuttle Knob, parameter selection, slew and cursor keys
23. DC Input Terminals
24. Voltage Sense Terminals
25. Module Pull-Out Lever and screw

41L0630 Singe DC Load Module

42L0860 Dual DC Load Module

41D5024 LED DC Load Module

SPECIFICATIONS - 41L SINGLE CHANNEL MODULES

MODEL		41L0630		41L0660		41L2512		41L5012		41L0615	
OPERATING RANGES											
Power Ranges		0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
Current Ranges		0-3 A	0-30 A	0-6 A	0-60 A	0-1.2 A	0-12 A	0-1.2 A	0-12 A	0-1.5 A	0-15 A
Voltage Range		60 V		60 V		250 V		500 V		60 V	
Minimum Voltage		0.6V @ 30A		0.6V @ 60A		1.0V @ 12A		6.0V @ 12A		0.3V @ 15A	
OPERATING MODES											
CC Mode	Range	0-3 A	0-30 A	0-6 A	0-60 A	0-1.2 A	0-12 A	0-1.2 A	0-12 A	0-1.5 A	0-15 A
	Resolution	0.05 mA	0.5 mA	0.1 mA	1 mA	0.02 mA	0.2 mA	0.02 mA	0.2 mA	0.0254 mA	0.25 mA
	Accuracy	± 0.1% OF (SETTING + RANGE)									
CR Mode	Range	2-120kΩ	0.02-2Ω	1-60kΩ	0.00833-1Ω	25-1500kΩ	0.08~25Ω	50~3000kΩ	0.5~50Ω	4~240kΩ	0.02~4Ω
	Resolution	0.00833mS	33.334µΩ	0.01666mS	16.667µΩ	0.000666mS	416.667µΩ	0.000333mS	833.334µΩ	0.04166mS	66.667µΩ
	Accuracy	± 0.2% OF (SETTING + RANGE)									
CV Mode	Range	0-6 V	0-60 V	0-6V	0-60V	0-30V	0-250 V	0-60 V	0-500 V	0-6 V	0-60 V
	Resolution	0.1 mV	1 mV	0.1 mV	1 mV	1 mV	10 mV	1 mV	10 mV	0.1 mV	1 mV
	Accuracy	± 0.05% OF (SETTING + RANGE)									
CP Mode	Range	0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
	Resolution	0.25 mW	2.5 mW	1 mW	10 mW	1 mW	10 mW	1 mW	10 mW	0.125 mW	1.25 mW
	Accuracy	± 0.5% OF (SETTING + RANGE)									
PROTECTION											
Over Power (OP)		157.5 W		315.0 W		315.0 W		315.0 W		78.75 W	
Over Current (OC)		31.5 A		63.0 A		12.6 A		12.6 A		15.75 A	
Over Voltage (OV)		63.0 V		63.0 V		262.5 V		525.0 V		63.0 V	
Over Temperature (OT)		+85° C / +185° F									
DYNAMIC OPERATION											
T high & T low		50 µs TO 9.999 s (20 kHz)									
Slew Rate		2.0-125 mA/µs	20-1250 mA/µs	4-250 mA/µs	40-2500 mA/µs	0.8-50 mA/µs	8-500 mA/µs	0.8-50 mA/µs	8.0-500 mA/µs	1.0-62.5 mA/µs	10.0-625 mA/µs
Accuracy		± 5% OF SETTING ± 10 µs									
METERING											
Voltage	Range	0 - 6.0 V	0 - 60.0 V	0 - 6.0 V	0 - 60.0 V	0 - 30.0 V	0 - 250.0 V	0 - 60.0 V	0 - 500.0 V	0 - 6.0 V	0 - 60.0 V
	Resolution	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV
	Accuracy	± 0.025% OF (READING + RANGE)									
Current	Range	0- 3.0 A	0- 30.0 A	0 - 6.0 A	0- 60.0 A	0 - 1.2 A	0 - 12.0 A	0 - 1.2 A	0 - 12.0 A	0 - 1.5 A	0 - 15.0 A
	Resolution	0.1 mA	1 mA	0.1 mA	1 mA	0.02 mA	0.2 mA	0.02 mA	0.2 mA	0.025 mA	0.25 mA
	Accuracy	± 0.1% OF (READING + RANGE)									
Power	Range	0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
	Accuracy	± 0.125% OF (READING + RANGE)									
SHORT CIRCUIT											
Typical Short Resistance		20 mΩ		8.3 mΩ		80 mΩ		0.5 Ω		20 mΩ	
Max. Short Current		30 A		60 A		12 A		12 A		15 A	
ANALOG I/O											
Current Monitor Out		0 - 10 V FULL SCALE									
Accuracy		± 0.5% OF (SETTING + RANGE)									
Current Programming In		0 - 10 V FULL SCALE									
GENERAL											
Power & Cooling		Supplied by 44M00 Mainframe									
Dimensions (H x W x D)		143 x 108 x 412 mm / 5.6" x 4.25" x 16.2"									
Module Weight (Net)		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs	
Operating Range		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F	
EMC & Safety		CE Mark									

SPECIFICATIONS - 41T SINGLE CHANNEL MODULES WITH TURBO MODE - 75W ~ 300W

MODEL	41T0630		41T0660		41T2512		41T5012		41T0615	
OPERATING RANGES										
Power Ranges	0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
Current Ranges (TURBO)	0-3 A	0-30A (90A)	0-6 A	0-60A (180A)	0-1.2 A	0-12A (36A)	0-1.2 A	0-12A (24A)	0-1.5 A	0-15A (60A)
Voltage Range	60 V		60 V		250 V		500 V		60 V	
Load ON Voltage	0.1V ~ 25V		0.1V ~ 25V		0.2V ~ 50V		0.4V ~ 100V		0.1V ~ 25V	
OPERATING MODES										
CC Mode Range	0-3 A	0-30 A	0-6 A	0-60 A	0-1.2 A	0-12 A	0-1.2 A	0-12 A	0-1.5 A	0-15 A
Resolution	0.05 mA	0.5 mA	0.1 mA	1 mA	0.02 mA	0.2 mA	0.02 mA	0.2 mA	0.0254 mA	0.25 mA
Accuracy	± 0.1% OF (SETTING + RANGE)									
CR Mode Range	2-120kΩ	0.02-2Ω	1-60kΩ	0.00833-1Ω	25-1500kΩ	0.08~25Ω	50~3000kΩ	0.5~50Ω	4~240kΩ	0.02~4Ω
Resolution	0.00833mS	33.334µΩ	0.01666mS	16.667µΩ	0.000666mS	416.667µΩ	0.000333mS	833.334µΩ	0.04166mS	66.667µΩ
Accuracy	± 0.2% OF (SETTING + RANGE)									
CV Mode Range	0-6 V	0-60 V	0-6V	0-60V	0-30V	0-250 V	0-60 V	0-500 V	0-6 V	0-60 V
Resolution	0.1 mV	1 mV	0.1 mV	1 mV	1 mV	10 mV	1 mV	10 mV	0.1 mV	1 mV
Accuracy	± 0.05% OF (SETTING + RANGE)									
CP Mode Range	0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
Resolution	0.25 mW	2.5 mW	1 mW	10 mW	1 mW	10 mW	1 mW	10 mW	0.125 mW	1.25 mW
Accuracy	± 0.5% OF (SETTING + RANGE)									
CC+CV Mode Range	60 V	0-30 A	60V	0-60 A	250 V	0-12 A	500 V	0-12 A	60 V	0-15 A
Resolution	1 mV	0.5 mA	1 mV	1 mA	0.01 V	0.2 mA	0.01 V	0.2 mA	1 mV	0.25 mA
Accuracy	± 1.0% OF (SETTING + RANGE)									
CP+CV Mode Range	60 V	0-150 W	60V	0-300 W	250 V	0-300 W	500 V	0-300 W	60 V	0-75 W
Resolution	1 mV	2.5 mW	1 mV	5 mW	0.01 V	5 mW	0.01 V	5 mW	1 mV	1.25 mW
Accuracy	± 1.0% OF (SETTING + RANGE)									
PROTECTION										
Over Power (OP)	157.5 W		315.0 W		315.0 W		315.0 W		78.75 W	
Over Current (OC)	31.5 A		63.0 A		12.6 A		12.6 A		15.75 A	
Over Voltage (OV)	63.0 V		63.0 V		262.5 V		525.0 V		63.0 V	
Over Temperature (OT)	+85° C / +185° F									
DYNAMIC OPERATION										
T high & T low	50 µs TO 9.999 s (20 kHz)									
Slew Rate	2.0-125 mA/µs	20-1250 mA/µs	4-250 mA/µs	40-2500 mA/µs	0.8-50 mA/µs	8-500 mA/µs	0.8-50 mA/µs	8.0-500 mA/µs	1.0-62.5 mA/µs	10.0-625 mA/µs
Accuracy	± 5% OF SETTING ± 10 µs									
METERING										
Voltage Range	0 - 6.0 V	0 - 60.0 V	0 - 6.0 V	0 - 60.0 V	0 - 30.0 V	0 - 250.0 V	0 - 60.0 V	0 - 500.0 V	0 - 6.0 V	0 - 60.0 V
Resolution	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV	0.1 mV	1 mV
Accuracy	± 0.025% OF (READING + RANGE)									
Current Range	0- 3.0 A	0- 30.0 A	0 - 6.0 A	0- 60.0 A	0 - 1.2 A	0 - 12.0 A	0 - 1.2 A	0 - 12.0 A	0 - 1.5 A	0 - 15.0 A
Resolution	0.1 mA	1 mA	0.1 mA	1 mA	0.02 mA	0.2 mA	0.02 mA	0.2 mA	0.025 mA	0.25 mA
Accuracy	± 0.1% OF (READING + RANGE)									
Power Range	0-15 W	0-150 W	0-30 W	0-300 W	0-30 W	0-300 W	0-30 W	0-300 W	0-7.5 W	0-75 W
Accuracy	± 0.125% OF (READING + RANGE)									
SHORT CIRCUIT										
Short Res. , Max SCC	20 mΩ, 90A		8.3 mΩ, 180 A		80 mΩ, 36 A		0.5 Ω, 24 A		20 mΩ, 60 A	
ANALOG I/O										
Current Monitor Out	Range: 0 - 10 V FULL SCALE, Accuracy: ± 0.5% OF (SETTING + RANGE)									
Current Programming In	0 - 10 V FULL SCALE									
GENERAL										
Dimensions (H x W x D)	143 x 108 x 412 mm / 5.6" x 4.25" x 16.2"									
Module Weight (Net)	3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs	
Operating Range	0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F	
Leakage Resistance into Open Load			140 kOhm							
EMC & Safety	CE Mark									

NEW & IMPROVED

SPECIFICATIONS - 41T SINGLE CHANNEL MODULES WITH TURBO MODE - 400W

MODEL	41T0880		41T5020	
OPERATING RANGES				
Power Ranges	0-40 W	0-400 W	0-40 W	0-400 W
Current Ranges (TURBO)	0-8 A	0-80A (160A)	0-2 A	0-20A (40A)
Voltage Range	80 V		500 V	
Load ON Voltage	0.1V ~ 25V		0.4V ~ 100V	
OPERATING MODES				
CC Mode Range	0-8.04 A	0-80.4 A	0-2.04 A	0-20.4 A
Resolution	0.135 mA	1.34 mA	0.034 mA	0.34 mA
Accuracy	± 0.1% OF (SETTING + RANGE)			
CR Mode Range	1Ω-60kΩ	0.083-1Ω	30Ω-1800kΩ	0.3-30Ω
Resolution	0.0166mS	0.0166mΩ	0.000555mS	0.5mΩ
Accuracy	± 0.2% OF (SETTING + RANGE)			
CV Mode Range	0-8.04 V	0-80.4 V	0-60V	0-500V
Resolution	0.134 mV	1.34 mV	1 mV	10 mV
Accuracy	± 0.05% OF (SETTING + RANGE)			
CP Mode Range	0-40.02 W	0-400.2 W	0-40.2 W	0-400.2 W
Resolution	0.667 mW	6.67 mW	0.667 mW	6.67 mW
Accuracy	± 0.5% OF (SETTING + RANGE)			
CC+CV Mode Range	80 V	0-80 A	500V	0-20 A
Resolution	0.134 mV	1.34 mA	10 mV	0.34 mA
Accuracy	± 1.0% OF (SETTING + RANGE)			
CP+CV Mode Range	80 V	0-400 W	500V	0-400 W
Resolution	0.134 mV	6.67 mW	10 mV	6.67 mW
Accuracy	± 1.0% OF (SETTING + RANGE)			
PROTECTION				
Over Power (OP)	420.0 W		420.0 W	
Over Current (OC)	84.0 A		21.0 A	
Over Voltage (OV)	84.0 V		525.0 V	
Over Temperature (OT)	+85° C / +185° F			
DYNAMIC OPERATION				
T high & T low	0.010~9.999 / 99./99 / 999.9 / 9.999 s (20 kHz)			
Slew Rate	5.4-337.5 mA/µs	54-3375 mA/µs	1.28-80 mA/µs	12.8-800 mA/µs
Accuracy	± 5% OF SETTING ± 10 µs			
METERING				
Voltage Range	0-8.04 V	0-80.4 V	0-60V	0-500V
Resolution	0.134 mV	1.34 mV	1 mV	10 mV
Accuracy	± 0.025% OF (READING + RANGE)			
Current Range	0-8.04 A	0-80.4 A	0-2.04 A	0-20.4 A
Resolution	0.135 mA	1.34 mA	0.034 mA	0.34 mA
Accuracy	± 0.1% OF (READING + RANGE)			
Power Range	0-100 W	0-400 W	0-100 W	0-400 W
	0.001 W	0.01 W	0.001 W	0.01 W
Accuracy	± 0.1% OF (READING + RANGE)			
SHORT CIRCUIT				
Short Res. , Max SCC	28.57 mΩ, 80A		0.3 Ω, 20 A	
ANALOG I/O				
Current Monitor Out	Range: 0 - 10 V FULL SCALE, Accuracy: ± 0.5% OF (SETTING + RANGE)			
Current Programming In	0 - 10 V FULL SCALE			
GENERAL				
Dimensions (H x W x D)	143 x 108 x 412 mm / 5.6" x 4.25" x 16.2"			
Module Weight (Net)	3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs	
Operating Range	0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F	
Leakage Resistance into Open Load	225 kOhm		1525 kOHm	
EMC & Safety	CE Mark			

SPECIFICATIONS - 42L DUAL CHANNEL MODULES

MODEL		42L0860		42L0824		42L0803	
OPERATING RANGES							
Power Ranges		0-25 W / 0-250 W	0-5 W / 0-50 W	0-12 W / 0-120 W	0-12W / 0-120 W	0-4 W / 0-40 W	0-4 W / 0-40 W
Current Ranges		0-6 A / 0-60 A	0-0.6 A / 0-6 A	0-2.4 A / 0-24 A	0-2.4 A / 0-24 A	0-0.3 A / 0-3 A	0-0.3 A / 0-3 A
Voltage Range		0-80 V	0-80 V	0-80 V	0-80 V	0-80 V	0-80 V
Minimum Voltage		0.8 V @ 60 A	0.8 V @ 6 A	0.8 V @ 24 A	0.8 V @ 24 A	0.3 V @ 3 A	0.3 V @ 3 A
OPERATING MODES							
CC Mode	Range	0-6 A / 0-60 A	0-0.6 A / 0-6 A	0-2.4 A / 0-24 A	0-2.4 A / 0-24 A	0-0.3 A / 0-3 A	0-0.3 A / 0-3 A
	Resolution	0.1 / 1mA	0.01 / 0.1mA	0.04 / 0.4mA		0.005mA / 0.05mA	
	Accuracy	± 0.1% OF (SETTING + RANGE)					
CR Mode	Range	0.01335 / 1.335 / 80.1kΩ	0.1335 / 13.35 / 801kΩ	0.0333 / 3.33 / 199.8kΩ	0.0333 / 3.33 / 199.8kΩ	0.267 / 26.7 / 1602kΩ	0.267 /26.7 / 1602kΩ
	Resolution	0.21µΩ / 0.0125mS	2.1µΩ / 0.00125mS	0.5µΩ / 0.005mS	0.5µΩ / 0.005mS	4.1µΩ / 0.000625mS	4.1µΩ / 0.000625mS
	Accuracy	± 0.2% OF (SETTING + RANGE)					
CV Mode	Range	0 - 6.0 V / 0 - 80.0 V	0 - 6.0 V / 0 - 80.0 V	0 - 6.0 V / 0 - 80.0 V	0 - 6.0 V / 0 - 80.0 V	0 - 6.0 V / 0 - 80.0 V	0 - 6.0 V / 0 - 80.0 V
	Resolution	0.135mV / 1.35mV	0.135mV / 1.35mV	0.135mV / 1.35mV	0.135mV / 1.35mV	0.135mV / 1.35mV	0.135mV / 1.35mV
	Accuracy	± 0.05% OF (SETTING + RANGE)					
CP Mode	Range	0-25 W / 0-250 W	0-5 W / 0-50 W	0-12 W / 0-120 W	0-12 W / 0-120 W	0-4 W / 0-40 W	0-4 W / 0-40 W
	Resolution	0.417mW / 4.17mW	0.084mW / 0.84mW	0.2mW / 2mW	0.2mW / 2mW	0.067mW / 0.67mW	0.067mW / 0.67mW
	Accuracy	± 0.5% OF (SETTING + RANGE)					
PROTECTION							
Over Power (OP)		262.5 W	52.5 W	126.0 W	126.0	42.0 W	42.0 W
Over Current (OC)		63.0 A	6.3 A	25.2 A	25.2 A	3.15 A	3.15 A
Over Voltage (OV)		84.0 V	84.0 V	84.0 V	84.0 V	84.0 V	84.0 V
Over Temperature (OT)		+85° C / +185° F					
DYNAMIC OPERATION							
T high & T low		0.050 - 9.999 / 0.50 - 99.99 / 5.0 - 999.9 / 50 - 9999ms (20 kHz)					
Resolution		1 µs / 10 µs / 0.1 ms / 1.0 ms					
Accuracy		Resolution + 50 ppm					
Slew Rate		4mA - 250mA/µs	0.4mA - 25mA/µs	1.6mA - 100mA/µs		0.2mA - 12.5mA/µs	
		40mA - 2500mA/µs	4mA - 250mA/µs	16mA - 1000mA/µs		2mA - 125mA/µs	
Accuracy		± 5% OF SETTING ± 10 µs					
Min. Rise Time		24 µs Typical					
METERING							
Voltage	Range	0 - 6.0 V / 0 - 81.0 V	0 - 6.0 V / 0 - 81.0 V	0 - 6.0 V / 0 - 81.0 V	0 - 6.0 V / 0 - 81.0 V	0 - 6.0 V / 0 - 81.0 V	0 - 6.0 V / 0 - 81.0 V
	Resolution	0.1 mV / 1.35 mV	0.1 mV / 1.35 mV	0.1 mV / 1.35 mV	0.1 mV / 1.35 mV	0.1 mV / 1.35 mV	0.1 mV / 1.35 mV
	Accuracy	± 0.025% OF (READING + RANGE)					
Current	Range	0 - 6.0 A / 0 - 60.0 A	0 - 0.6 A / 0 - 6.0 A	0 - 2.4 A / 0 - 24.0 A		0 - 0.3 A / 0 - 3.0 A	
	Resolution	0.1 mA / 1.0 mA	0.01 mA / 0.1 mA	0.04 mA / 0.4 mA		5 µA / 50 µA	
	Accuracy	± 0.1% OF (READING + RANGE)					
Power	Range	0 - 250.0 W	0 - 50.0 W	0 - 120.0 W		0 - 40.0 W	
	Accuracy	± 0.125% OF (READING + RANGE)					
SHORT CURRENT							
Typical Short Resistance		13.33 mΩ	1.33 mΩ	33.33 mΩ	33.33 mΩ	0.1 Ω	0.1 Ω
Max. Short Current		60 A	6 A	24 A	24 A	3 A	3 A
GENERAL							
Power & Cooling		Supplied by 44M00 Mainframe					
Dimensions (H x W x D)		143 x 108 x 405 mm / 5.6" x 4.25" x 16.0"					
Module Weight (Net)		3.5 kg / 7.7 lbs		3.7 kg / 7.7 lbs		3.7 kg / 7.7 lbs	
Operating Range		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F	
EMC & Safety		CE Mark					

SPECIFICATIONS - 41D & 42D LED SIMULATION MODULES

MODEL		41D3024		41D5012		41D5024		41D1204	
OPERATING RANGES									
Power Ranges		0-300 W		0-300 W		0-300 W		0-150 W	
Current Ranges		0 - 6.0 A	0 - 24 A	0 - 3.0 A	0 - 12 A	0 - 6.0 A	0 - 24 A	0 - 1.2 A	0 - 4 A
Voltage Range		0 - 300 V		0 - 500 V		0 - 500 V		0 - 120 V	
Minimum Voltage		3 V @ 24 A		6 V @ 12 A		6 V @ 24 A		3 V @ 4 A	
OPERATING MODES									
CC Mode	Range	0 - 6.0 A	0 - 24 A	0 - 3.0 A	0 - 12 A	0 - 6.0 A	0 - 24 A	0 - 1.2 A	0 - 4 A
	Resolution	0.1mA	0.4mA	0.05mA	0.2mA	0.1mA	0.4mA	0.02mA	0.08mA
	Accuracy	± 0.1% OF (SETTING + RANGE)							
CR Mode	Range	Low:125Ω - 1.5kΩ 150V	High:0.25Ω - 3kΩ 300V	Low:0.5Ω - 1.5kΩ 300V	High:1Ω - 3kΩ 500V	Low:0.25Ω - 3kΩ 300V	High:0.5Ω - 6kΩ 500V	Low:0.75Ω - 750Ω 60V	High:1.5Ω - 1.5kΩ 120V
	Resolution	133.33 µS	66.666 µS	33.333 µS	16.666 µS	66.666 µS	33.333 µS	66.666 µS	33.333 µS
	Accuracy	± 0.2% OF (SETTING + RANGE)							
CV Mode	Range	30 V / 150 V / 300 V		60 V / 300 V /500 V		60 V / 300 V /500 V		30 V / 60 V / 120 V	
	Resolution	0.5 mV / 0.25 mV / 5 mV		1 mV / 5 mV / 10 mV		1 mV / 5 mV / 10 mV		0.5 mV / 1 mV / 2 mV	
	Accuracy	± 0.05% OF (SETTING + RANGE)							
CP Mode	Range	0 - 300 W		0 - 300 W		0 - 300 W		0 - 150 W	
	Resolution	5 mW		5 mW		5 mW		2.5 mW	
	Accuracy	± 0.5% OF (SETTING + RANGE)							
LED Mode	Vo Range	30 V / 150 V / 300 V		60 V / 300 V / 500 V		60 V / 300 V / 500 V		30 V / 60 V / 120 V	
Rd Res. Range - Low		0.125-125Ω @ Vo-Vd= 0 - 3V		0.5-100Ω @ Vo-Vd= 0 - 6V		0.25-125Ω @ Vo-Vd= 0 - 6V		0.625-0.75kΩ @ Vo-Vd= 0 - 3V	
		1.25-1.25kΩ @ Vo-Vd= 3 - 30V		5-1kΩ @ Vo-Vd= 6 - 60V		2.5-1.25kΩ @ Vo-Vd= 6 - 60V		6.25-7.5kΩ @ Vo-Vd= 3 - 30V	
Rd Res. Range - Med.		0.625-625Ω @ Vo-Vd= 0 - 15V		2.5-500Ω @ Vo-Vd= 0 - 30V		1.25-625Ω @ Vo-Vd= 0 - 30V		1.25-1.5kΩ @ Vo-Vd= 0 - 6V	
		6.25-6.25kΩ @ Vo-Vd= 15-150V		25-5kΩ @ Vo-Vd= 30-300V		12.5-6.25kΩ @ Vo-Vd=30-300V		12.5-15kΩ @ Vo-Vd= 6-60V	
Rd Res. Range - High		1.25-1.25kΩ @ Vo-Vd= 0 - 30V		5-1kΩ @ Vo-Vd= 0 - 60V		2.5-1.25kΩ @ Vo-Vd= 0 - 60V		2.5-3kΩ @ Vo-Vd= 0 - 12V	
		12.5-12.5kΩ @ Vo-Vd= 30-300V		50-10kΩ @ Vo-Vd= 60-500V		25-12.5kΩ @ Vo-Vd= 60-500V		25-30kΩ @ Vo-Vd= 12-120V	
Resolution		16 bits							
Accuracy		Vd : ± (0.05% OF SETTING + 0.1% OF RANGE), Rd : ± (0.05% OF SETTING + 0.1% OF RANGE)							
PROTECTION									
Over Power (OP)		315.0 W		315.0 W		315.0 W		157.5 W	
Over Current (OC)		25.2 A		12.6 A		25.2 A		4.2 A	
Over Voltage (OV)		315.0 V		525.0 V		525.0 V		126.0 V	
Over Temperature (OT)		+90° C / +194° F							
DYNAMIC OPERATION									
T high & T low		0.050 ~ 9.999 / 99.99 / 999.9 / 9999ms (20 kHz)							
Resolution		1 µs / 10 µs / 0.1 ms / 1.0 ms							
Accuracy		Resolution + 50 ppm							
Slew Rate		4.8 - 300 mA/µs	19.2 - 1200 mA/µs	2.4 - 150 mA/µs	9.6 - 600 mA/µs	4.8 - 300 mA/µs	19.2 - 1200 mA/µs	0.96 -60 mA/µs	3.84 - 240 mA/µs
Resolution		1.2mA/µs	4.8mA/µs	0.6mA/µs	2.4mA/µs	1.2mA/µs	4.8mA/µs	0.24mA/µs	0.96mA/µs
Accuracy		± 5% OF SETTING ± 10 µs							
Min. Rise Time		20 µs Typical							
METERING									
Voltage	Range	0-30V / 0-150V / 0-300V		0-60V / 0-300V / 0-500V		0-60V / 0-300V / 0-500V		30 V / 60 V / 120 V	
	Resolution	0.5 mV / 2.5 mV / 5 mV		1 mV / 5 mV / 10 mV		1 mV / 5 mV / 10 mV		0.5 mV / 1 mV / 2 mV	
	Accuracy	± 0.025% OF (READING + RANGE)							
Current	Range	0 - 6.0 A	0 - 24 A	0 - 3.0 A	0 - 12 A	0 - 6.0 A	0 - 24 A	0 - 1.2 A	0 - 4.0 A
	Resolution	0.1 mA	0.4 mA	0.05 mA	0.2 mA	0.1 mA	0.4 mA	0.02 mA	0.08 mA
	Accuracy	± 0.1% OF (READING + RANGE)							
Power	Range	0 - 300.0 W		0 - 300.0 W		0 - 300.0 W		0 - 150.0 W	
	Accuracy	± 0.1% OF (READING + RANGE)							
PWM DIMMING CONTROL									
Level		Range: 0 - 12 V, Resolution: 48 mV, Accuracy: ± 1% OF (SETTING + RANGE)							
Frequency		Range: DC to 1000 Hz, Resolution: 10 Hz							
Duty Cycle		Range: 0.01 - 0.99 (1% - 99%), Resolution: 0.01 (1%)							
GENERAL									
Current Monitor Out		2.4 A/V		1.2 A/V		2.4 A/V		0.4 A/V	
Shorting Relay Drive		12 V @ 100 mA max							
Power & Cooling		Supplied by 44M00 Mainframe, Temp. Coefficient: 100 ppm / °C typical							
Dimensions (H x W x D)		143 x 108 x 412 mm / 5.6" x 4.25" x 16.2"							
Module Weight (Net)		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs		3.7 kg / 8.2 lbs	
Operating Range		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F		0 - 40° C / 32 - 104° F	
EMC & Safety		CE Mark							

MODEL	42D5006		42D1202	
OPERATING RANGES				
Power Ranges	0-150 W	0-150 W	0-75 W	0-75 W
Current Ranges	0-1.5A / 0-6A	0-1.5A / 0-6A	0-0.6A / 0-2A	0-0.6A / 0-2A
Voltage Range	0 - 500 V	0 - 500 V	0 - 120 V	0 - 120 V
Minimum Voltage	4 V @ 6 A		3 V @ 2 A	
OPERATING MODES				
CC Mode Range	0 - 1.5 A	0 - 6.0 A	0 - 0.6 A	0 - 2.0 A
Resolution	0.025mA	0.1mA	0.01 mA	0.04 mA
Accuracy	± 0.1% OF (SETTING + RANGE)			
CR Mode Range	Low:1Ω - 3kΩ 300V	High:2Ω - 6kΩ 500V	Low:1.5Ω - 15kΩ 60V	High:3Ω - 3kΩ 120V
Resolution	16.666 µS	8.333 µS	33.33 µS	16.66 µS
Accuracy	± 0.2% OF (SETTING + RANGE)			
CV Mode Range	60 V / 300 V / 500 V		30 V / 60 V / 120 V	
Resolution	1 mV / 5 mV / 10 mV		0.5 mV / 1 mV / 2 mV	
Accuracy	± 0.05% OF (SETTING + RANGE)			
CP Mode Range	N/A		N/A	
Resolution	N/A		N/A	
Accuracy	N/A		N/A	
LED Mode Vo Range	60 V / 300 V / 500 V		30 V / 60 V / 120 V	
Rd Res. Range - Low	1-200Ω @ Vo-Vd= 0 - 6V		1.25-1.5kΩ @ Vo-Vd= 0 - 3V	
	10-2kΩ @ Vo-Vd= 6 - 60V		1.5-15kΩ @ Vo-Vd= 3 - 30V	
Rd Res. Range - Med.	5-1kΩ @ Vo-Vd= 0 - 30V		2.5-3kΩ @ Vo-Vd= 0 - 6V	
	50-10kΩ @ Vo-Vd= 30-300V		25-30kΩ @ Vo-Vd= 6-60V	
Rd Res. Range - High	10-2kΩ @ Vo-Vd= 0 - 60V		5-6kΩ @ Vo-Vd= 0 - 12V	
	100-20kΩ @ Vo-Vd= 60-500V		50-60kΩ @ Vo-Vd= 12-120V	
Resolution	16 bits			
Accuracy	Vd : ± (0.05% OF SETTING + 0.1% OF RANGE), Rd : ± (0.05% OF SETTING + 0.1% OF RANGE)			
PROTECTION				
Over Power (OP)	157.5 W		78.75 W	
Over Current (OC)	6.3 A		2.1 A	
Over Voltage (OV)	525.0 V		126.0 V	
Over Temperature (OT)	+90° C / +194° F			
METERING				
Voltage Range	0-60V / 0-300V / 0-500V		30 V / 60 V / 120 V	
Resolution	1 mV / 5 mV / 10 mV		0.5 mV / 1 mV / 2 mV	
Accuracy	± 0.025% OF (READING + RANGE)			
Current Range	0 - 1.5 A	0 - 6.0 A	0 - 0.6 A	0 - 2.0 A
Resolution	0.025 mA	0.1 mA	0.01 mA	0.04 mA
Accuracy	± 0.1% OF (READING + RANGE)			
Power Range	0 - 150.0 W		0 - 75.0 W	
Accuracy	± 0.1% OF (READING + RANGE)			
PWM DIMMING CONTROL				
Level	Range: 0 - 12 V, Resolution: 48 mV, Accuracy: ± 1% OF (SETTING + RANGE)			
Frequency	Range: DC to 1000 Hz, Resolution: 10 Hz			
Duty Cycle	Range: 0.01 - 0.99 (1% - 99%), Resolution: 0.01 (1%)			
GENERAL				
Current Monitor Out	0.6 A/V		0.2 A/V	
Shorting Relay Drive	12 V @ 100 mA max			
Power & Cooling	Supplied by 44M00 Mainframe, Temp. Coefficient: 100 ppm / °C typical			
Dimensions (HxWxD)	143 x 108 x 412 mm / 5.6" x 4.25" x 16.2"			
Module Weight (Net)	3.5 kg / 7.7 lbs			
Operating Range	0 - 40° C / 32 - 104° F			
EMC & Safety	CE Mark			

ORDERING INFORMATION:

Line 1: Specify Mainframe Model. *(Specify T version for 41T use):*

One Slot	Two Slots	Four Slots
44M01 / 44M01T	44M02 / 44M02T	44M04 / 44M04T

Line 2: Specify Remote Control Option:
None, Opt GPIB, Opt RS232, Opt USB or Opt LAN

Line 3: Specify up to four Load Modules:

41L Single CH	41T Single CH	42L Dual CH	41D LED CH
41L0630	41T0630	42L0860	41D3024
41L0660	41T0660	42L0824	41D5012
41L2512	41T2512	42L0803	41D5024
41L5012	41T5012		41D1204
41L0615	41T0615		**42D LED CH**
	41T0880		42D5006
	41T5020		42D1202

Line 4: Specify Shorting Relay option for LED Load:

Relay Option	Description	Compatible with
Opt R002	Shorting Relay Fixture	41D3002/41D5002
Opt R003	Shorting Relay Fixture	42D5003
Opt R006	Shorting Relay Fixture	42D5006
Opt R012	Shorting Relay Fixture	41D5012
Opt R020	Shorting Relay Fixture	41D1020
Opt R024	Shorting Relay Fixture	41D3024 & 41D5024

Line 5: Add CWG and/or QCT Options as needed

External Option	Description	Compatible with
Opt QCT	Quick Charger Tester	41L, 42L and 41G/42G
Opt CWG	Current Waveform Generator	44Mxx, 5L, 5V, 5P, 5VP

AC Input Voltage

Please specify AC Line input voltage at the ship to location on the order as either 120Vac or 230Vac.

Included in Mainframe Ship kit:

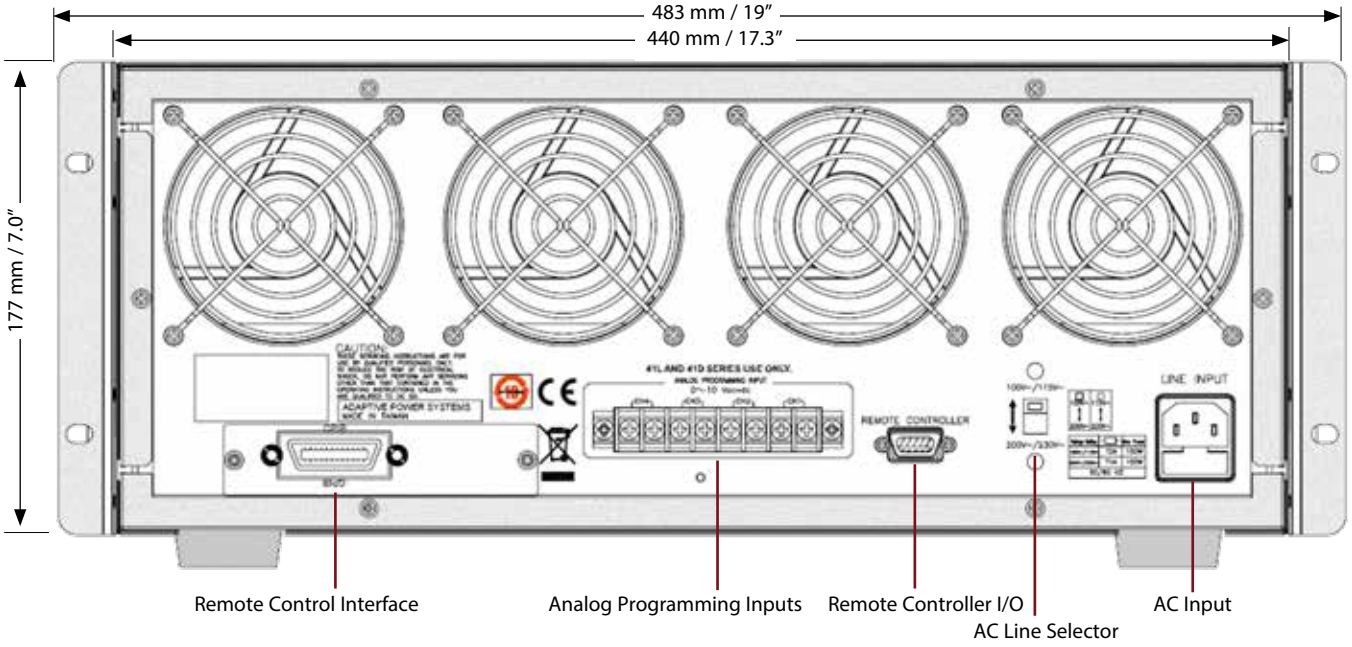
User Manuals in PDF Format on CD ROM.
AC Line Cord.
LAN/USB Driver CD ROM (with Opt USB or Opt LAN).
Certificate of Conformance

Included with each 4 Series Load Module:

Item	41L / 41T	42L	41D	42D
Banana plug, 4 mm, Red	1	2	1	-
Banana plug, 4 mm, Black	1	2	1	-
Banana plug, 2 mm, Red	1	2	3	8
Banana plug, 2 mm, Black	1	2	3	8
Y-hook Terminal, Large	4	4	4	-
Y-hook Terminal, Small	2	-	-	4
BNC Cable, 3 feet	1	-	1	-

4 SERIES MODULAR DC LOADS

MAINFRAME REAR PANEL



Service and Support

Adaptive Power Systems' customer support is second to none. Our Customer Support Program provides the training, repair, calibration, and technical support services that our customers value. So, in addition to receiving the right test equipment, our customers can also count on excellent support before, during and after the sale. With company owned support and service centers around the world, support is never far away.

New Product Warranty: AC Sources & Loads: 1 year, DC Power Supplies: 2 years.

Complete calibration and repair services are offered at our US, European and Chinese manufacturing facilities (see contact info below). Calibrations are to original factory specifications and are traceable to NIST (National Institute of Standards and Technology).

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