41T Series

DC Load with Turbo Boost

Up to 800W; up to 1.6kW in Turbo Mode

Key Features

- Compact Bench-top; Modular Form Factor
- Max. Power 800W continuous
- 1600W in TURBO mode
- Voltage Ranges, 80Vdc or 500 Vdc
- Max. Current Range 160 Adc in continuous and 320A in TURBO-mode
- Operating Modes: CC, CP, CR, CV, CC+CV and CP+CV
- Built-in Short Circuit Test
- Built-in Power Supply Over Current Protection Test Mode
- Static and Dynamic CC Modes
- Fast Current Slew Rates
- USB, RS232, GPIB and LAN Interface Options

GPIB RS232 USB UNIVERSAL SERIAL BUS LAN CE

OVERVIEW

The ADAPTIVE POWER 41T Series DC Electronic Loads 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 41T Series units support 800W in a compact form factor.

The 41T Bench top Series consists of two models offering a choice between high current (up to 160Adc) or high voltage (up to 500Vdc). Both models offer dual range capability for optimal accuracy and resolution and are available as stand-alone bench units or modular plug-ins for the 44M04 Load Mainframe.

UNIQUE TURBO MODE

The 41T Series 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.

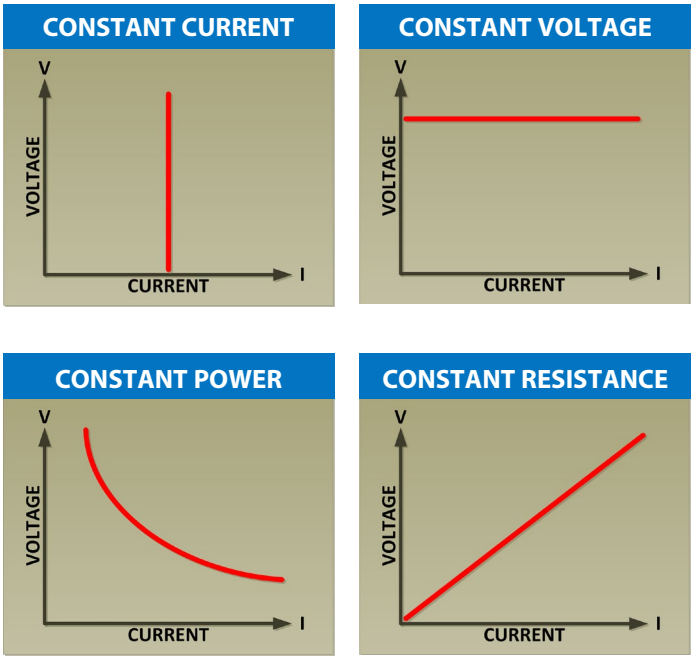
Other special test modes offered by the 41T Series are:

- Battery Discharge Test
- Lithium Battery Management System (BMS) Test
- Fuse, Breaker, PTC Specification Test

OPERATING MODES

All 41T Series loads support multiple 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.

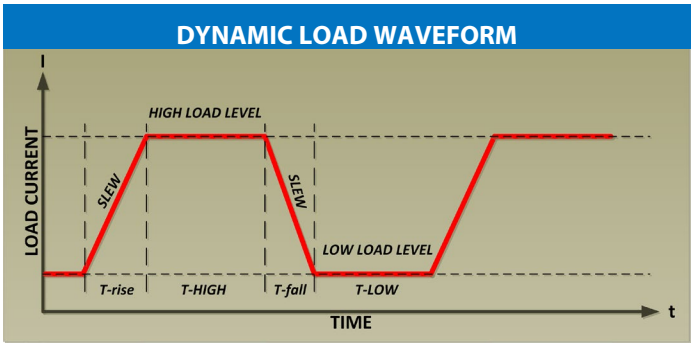
The available operating modes are Constant Current, Constant Voltage, Constant Power and Constant Resistance. Combinations of modes such as CP+CV and CC+CV are provided as well for battery testing. A graphical representation of these modes of operation is shown here.



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 41T Loads serve this purpose by offering high speed programmable dynamic load control programmability.

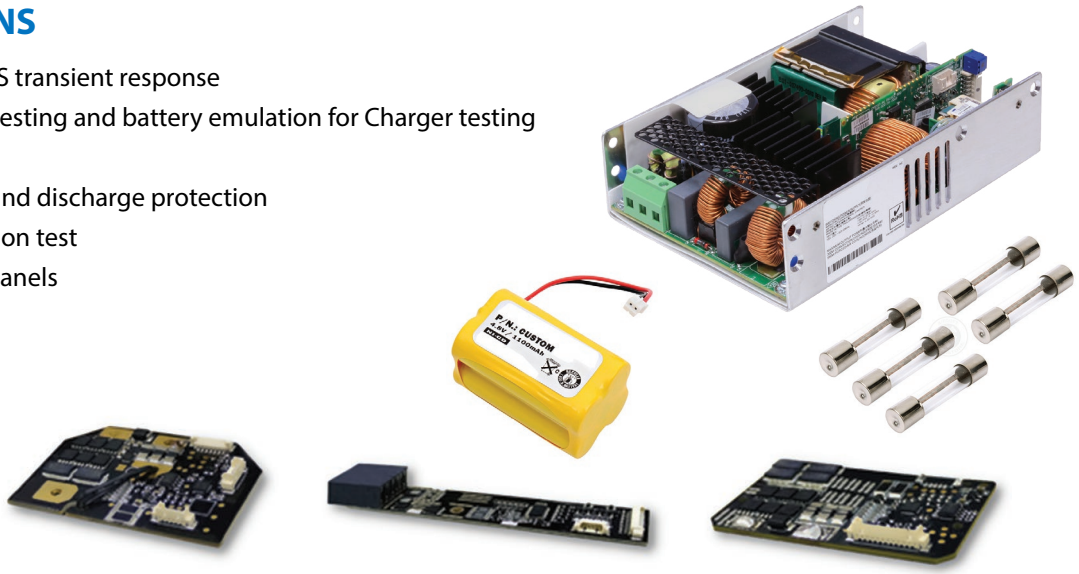
The diagram below illustrates the variable load current slew rates and dwell times that can be programmed on the 4 Series loads.



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.

TYPICAL APPLICATIONS

- Voltage / Current source SMPS transient response
- Voltage Source Current limit testing and battery emulation for Charger testing
- Battery discharge capacity
- Lithium battery BMS charge and discharge protection
- Fuse , Breaker , PTC specification test
- MPPT test function for solar panels
- R&D, Quality Control
- ATE systems
- Production testing

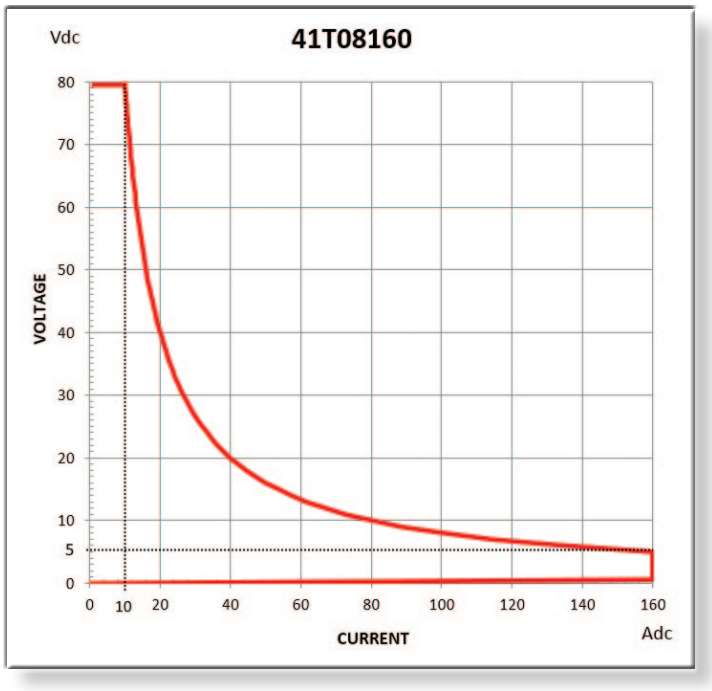


CONSTANT POWER INPUT RANGE

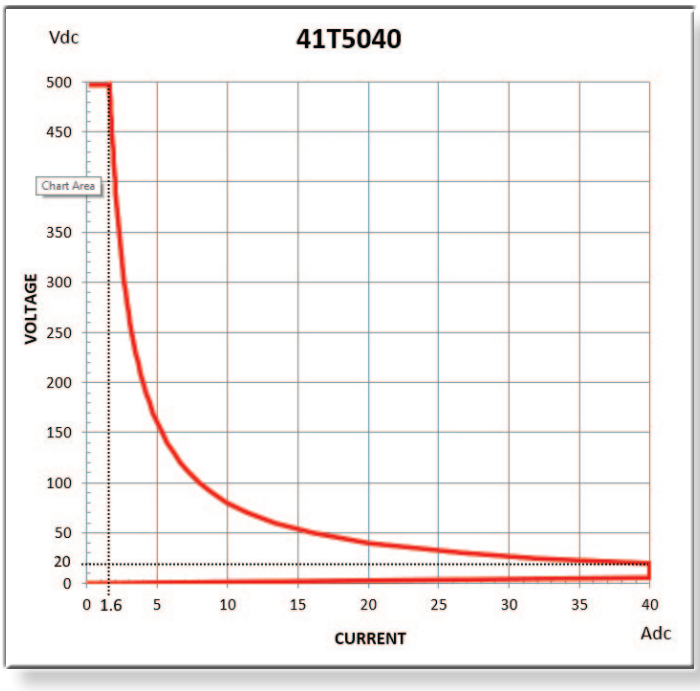
The 41T Series loads are designed to accommodate a wide range of voltage and current input combinations within their maximum power capability. This allows the same load to be used for higher voltage and low current requirements as well as low voltage higher current applications. Typical V-I operating curves for both 41T models are shown below. Bounded by the maximum voltage and maximum current, the input range follows an 800W 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 automated test systems.



Model 41T08160(M) Constant Power V-I Range



Model 41T5040(M) Constant Power V-I Range

AVAILABLE FORM FACTORS

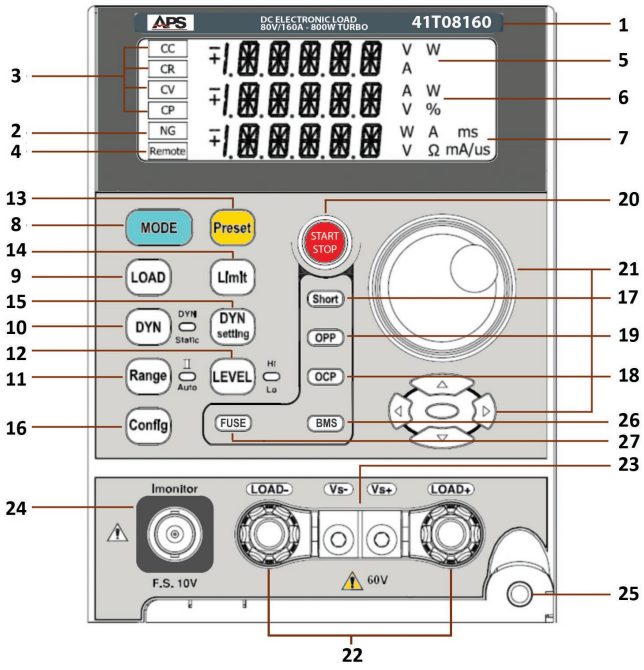
Model 41T08160 or 41T5040 Bench Top Form Factor

Model 41T08160 or 41T5040 Modular Form Factor shown with 44M04 Mainframe

LOAD MODULE FRONT PANEL OPERATION

The 41T Series bench models use the same intuitive front panel operation as the 4-Series modular DC loads. The front panel sports a keypad, rotary shuttle and white LED back-lit LCD display for easy of operation. Sample shown below is for Model 41T08160.

1. Model Number and ranges
2. Go/No Go 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. MODE toggle buttons
9. LOAD ON/OFF button and indicator
10. DYNAMIC mode button and indicator
11. High or Low Range Selection
12. High or Low Load Setting Selection

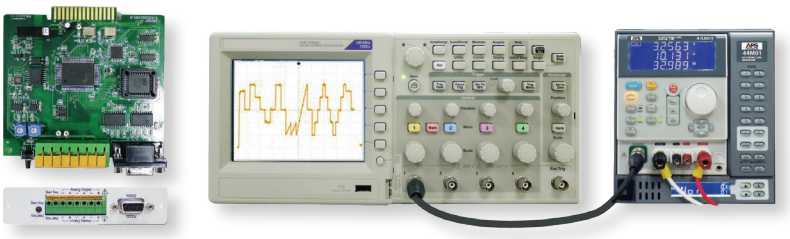


13. Preset Mode ON/OFF
14. Limit Setup Menu
15. DYNAMIC mode settings
16. Configuration Menu
17. Short Circuit Test key and indicator
18. OCP (Over Current Protection) Test key
19. OPP (Over Power Protection) Test key
20. SHORT, OCP & OPP Start/Stop
21. Shuttle Knob, parameter selection, slew and cursor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

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 (41T5040 only)

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.

SPECIFICATIONS - 41T SERIES DC LOADS WITH TURBO MODE

MODEL		41T08160 / 41T08160M		41T5040 / 41T5040M	
OPERATING RANGES					
Power Ranges		0-80 W	0-800 W	0-80 W	0-800 W
Current Ranges (TURBO)		0-16 A	0-160A (320A)	0-4 A	0-40A (80A)
Voltage Range		80 V		500 V	
Load ON Voltage		0.1V ~ 25V		0.4V ~ 100V	
OPERATING MODES					
CC Mode	Range	0-16.02 A	0-160.2 A	0-4.02 A	0-40.2 A
	Resolution	0.267 mA	26.7 mA	0.067 mA	0.67 mA
	Accuracy	± 0.1% OF (SETTING + RANGE)			
CR Mode	Range	0.5Ω-30kΩ	0.0416Ω-0.5Ω	15Ω-900kΩ	0.15Ω-15Ω
	Resolution	0.0166mS	0.00833mΩ	0.00111mS	0.25mΩ
	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	0-80.04 W	0-800.4 W	0-80.4 W	0-800.4 W
	Resolution	1.334 mW	13.34 mW	1.334 mW	13.34 mW
	Accuracy	± 0.5% OF (SETTING + RANGE)			
CC+CV Mode	Range	80 V	0-80 A	500V	0-20 A
	Resolution	1.34 mV	1.34 mA	10 mV	0.34 mA
	Accuracy	± 1.0% OF (SETTING + RANGE)			
CP+CV Mode	Range	80 V	0-800 W	500V	0-800 W
	Resolution	1.34 mV	13.34 mW	10 mV	13.34 mW
	Accuracy	± 1.0% OF (SETTING + RANGE)			
PROTECTION					
Over Power (OP)		840.0 W		840.0 W	
Over Current (OC)		168.0 A		42.0 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		10.8-675 mA/µs	10.8-6750 mA/µs	2.56-160 mA/µs	25.6-1600 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	0-16.02 A	0-160.2 A	0-4.02 A	0-40.2 A
	Resolution	0.267 mA	2.67 mA	0.067 mA	0.67 mA
	Accuracy	± 0.1% OF (READING + RANGE)			
Power	Range	0-100 W	0-800 W	0-100 W	0-800 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		0.00415 Ω, 160A		0.15 Ω, 40 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					
Operating Range | Cooling		0 - 40° C / 32 - 104° F @ 700W, 0 - 25°C / 32 - 77°F for 800W ! Variable Speed Fan Cooled			
Dimensions (H x W x D)		187 x 269 x 486 mm / 7.4" x 10.6" x 19.1"			
Weight (Net)		14.5 kg / 32.0 lbs		14.5 kg / 32.0 lbs	
Leakeage Resistance into Open Load		225 kOhm			
EMC & Safety		CE Mark			

ORDERING INFORMATION:

Line 1: DC Load Model:

Model	Description
41T08160	DC Load, 800W, 80V, 160A /Turbo 1600W, 320A, Bench
41T08160M	DC Load Module, 800W, 80V, 160A /Turbo 1600W, 320A
41T5040	DC Load, 800W, 500V, 40A /Turbo 1600W, 80A
41T5040M	DC Load Module, 800W, 500V, 40A /Turbo 1600W, 80A

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

Line 3: For Load Modules (M Version), add 44M02 or 44M04 Mainframe

Line 4: Add CWG and/or QCT (41T5040) Options as needed

External Option	Description	Compatible with
Opt QCT	Quick Charger Tester	41L, 42L and 41T
Opt CWG	Current Waveform Generator	44Mxx, 41T, 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 Ship kit:

User Manuals in PDF Format on CD ROM.
AC Line Cord.
Certificate of Conformance

Included with each 41T Series Load:

Item	41T Models
Banana plug, 4 mm, Red	1
Banana plug, 4 mm, Black	1
Banana plug, 2 mm, Red	1
Banana plug, 2 mm, Black	1
Y-hook Terminal, Large	4
Y-hook Terminal, Small	2
BNC Cable, 3 feet	1

WORLDWIDE 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. Customers can rely on us for excellent support before, during and after the sale with support and service centers around the world.

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

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