

# 41S Series

## Low Power DC Load Benchtop

### Up to 700W

#### Key Features

- Cost Effective Economy DC Loads
- Compact Bench-top or Modular
- up to 700W
- Voltage Ranges, 80Vdc or 500 Vdc
- Max. Current Range 140 Adc
- Operating Modes: CC, CP, CR, CV
- Built-in Short Circuit Test
- Built-in Power Supply Over Current Protection Test Mode
- Static and Dynamic CC & CP Modes
- Fast Current Slew Rates
- Built in Battery Test Functions
- Standard USB and RS232 Interfaces



#### OVERVIEW

The ADAPTIVE POWER 41S Series of Economy DC Electronic Loads are ideally suited for testing a variety of AC/DC power supplies, DC/DC converters, battery chargers and other DC power products.

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

The high power density and affordable price point of the 41S Series units support 250W, 350W or 700W in a compact bench top package.

The 41S Bench top Series consists of five models offering a choice between high current (up to 140Adc) or high voltage (up to 500Vdc). All models offer dual range capability for optimal accuracy and resolution.

#### SPECIAL FUNCTIONS

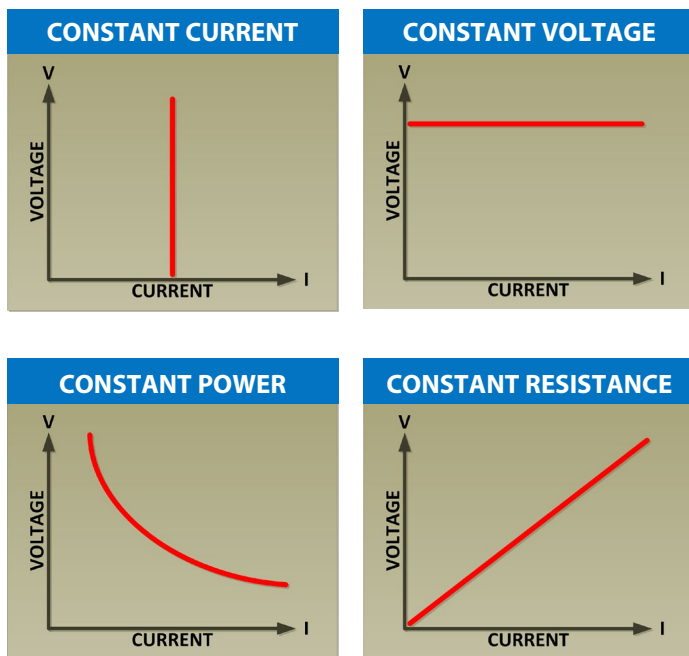
The 41S Series of DC loads offer many of the functions normally found in more expensive DC load models. Among others, the following test modes are supported:

- Battery Charging Test
- Battery Discharge Test
- Current Limit Trip Test
- Current Surge test with power-on inrush simulation
- Short Test for Fuse, Breaker, PTC Specification Test

## OPERATING MODES

All 41S 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.

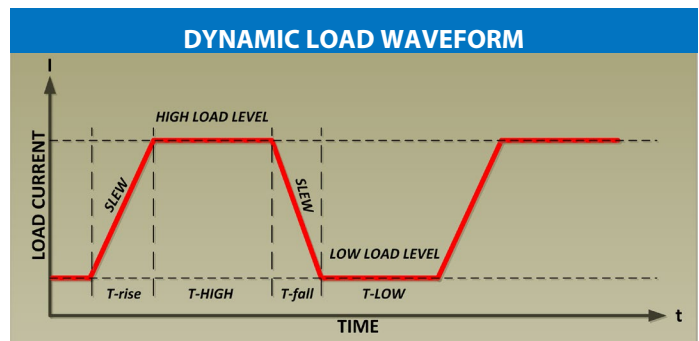
The available operating modes are Constant Current (CC), Constant Voltage (CV), Constant Power (CP) and Constant Resistance (CR). A graphical representation of these modes of operation is shown here.



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

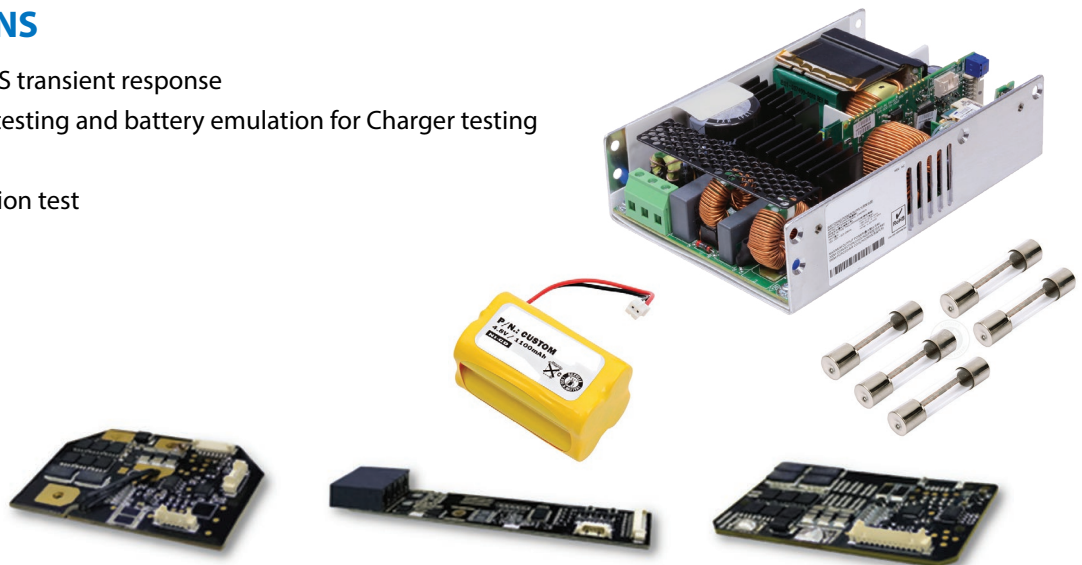
The diagram below illustrates the variable load current slew rates and dwell times that can be programmed on the 4 Series loads.



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 6 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
- Fuse , Breaker , PTC specification test
- R&D, Quality Control
- ATE systems
- Production testing

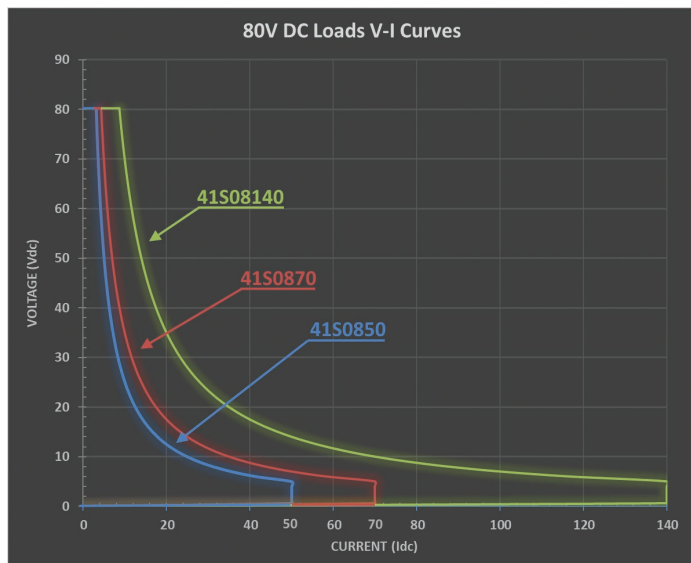


## CONSTANT POWER INPUT RANGE

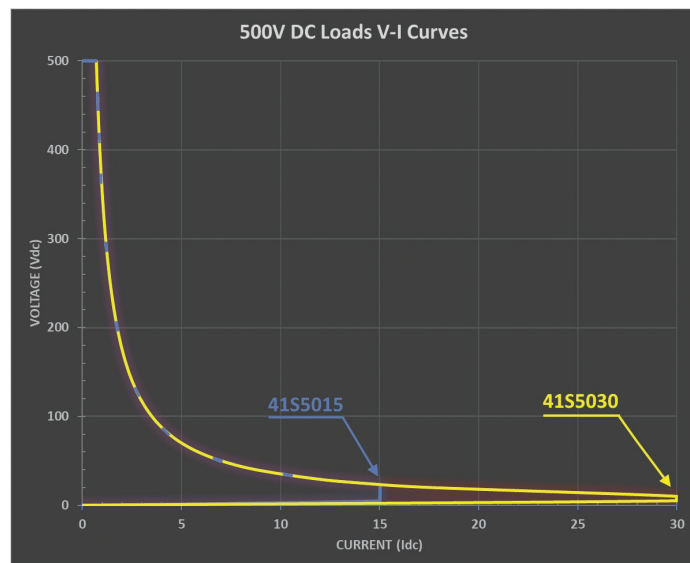
The 41S Series loads are designed to accommodate a wide range of voltage and current input combinations within their maximum power capability. This allows the same load to be used for higher voltage and low current requirements as well as low voltage higher current applications. Typical V-I operating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



*41S08xxx 80V Models Constant Power V-I Range*



*41S50xx 500V Models Constant Power V-I Range*

## AVAILABLE FORM FACTORS



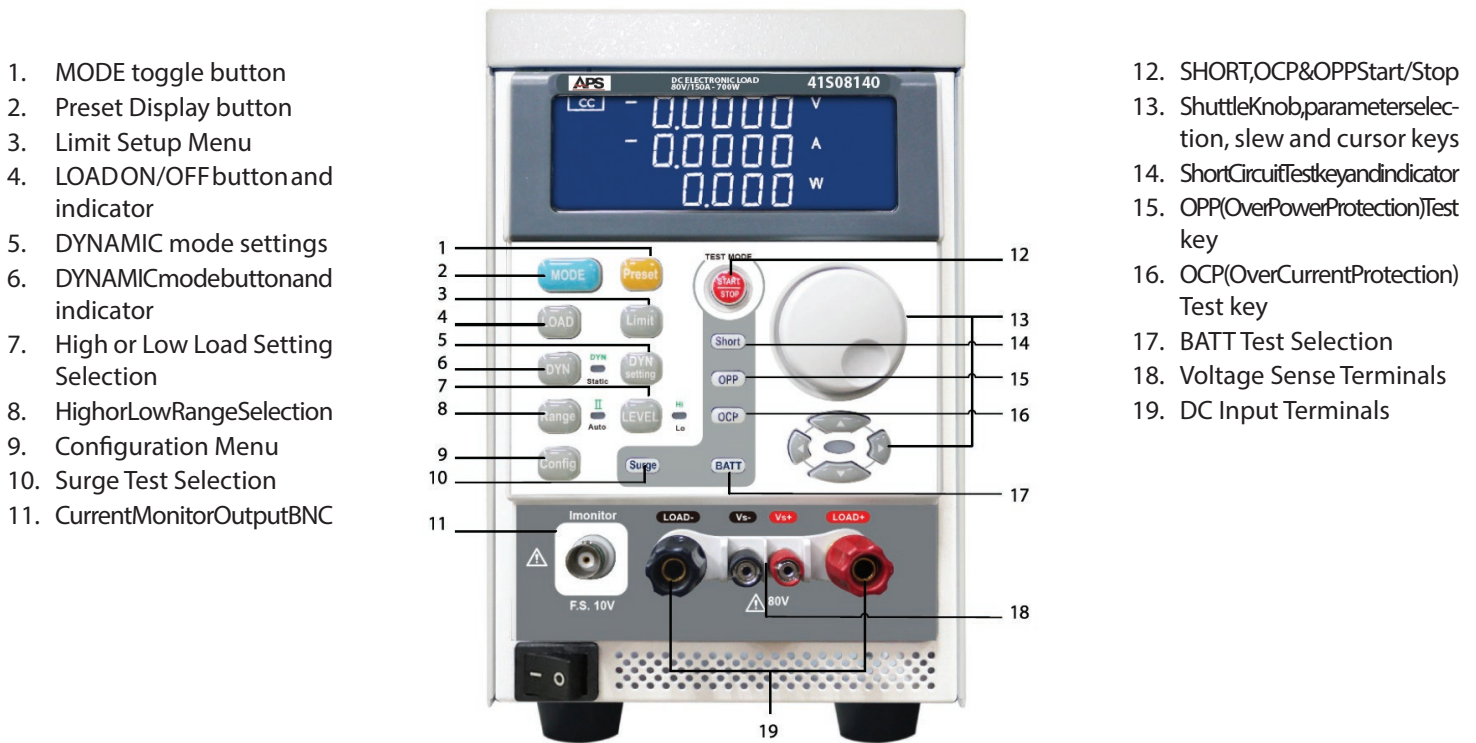
*Slim line & 350W Power Models*



*Double wide 700W Power Models*

## LOAD MODULE FRONT PANEL OPERATION

The 41S 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 ease of operation. Sample shown below is for Model 41S08140.



## AVAILABLE OPTIONS

### 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, tablets 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 - 41S SERIES DC LOADS

MODEL	41S0850	41S0870	41S5015	41S08140	41S5030
OPERATING RANGES					
Power Ranges	0-250 W	0-350 W	0-350 W	0-700 W	0-700 W
Current Ranges	0-50 A	0-70 A	0-15 A	0-140 A	0-30 A
Voltage Range	80 V	80 V	500 V	80 V	500 V
Min. Operating Voltage	0.1V @ 50 A	1.2V @ 70 A	6.0V @ 15 A	0.9V @ 140 A	3.0V @ 30 A
Load ON / OFF Voltage	1.0 ~ 25 V / 0 ~ 25 V	0.1 ~ 25 V / 0 ~ 25 V	0.4 ~ 100 V / 0 ~ 100 V	0.1 ~ 25 V / 0 ~ 25 V	0.4 ~ 100 V / 0 ~ 100 V
OPERATING MODES					
<b>CC Mode</b> Range	0 ~ 5.04 ~ 50.4 A	0 ~ 7.02 ~ 70.2 A	0~ 1.5 ~ 15 A	0 ~ 14.04 ~ 140.4 A	0 ~ 3.0 ~ 3.0 ~ 30.0 A
Resolution	0.084 mA / 0.84 mA	0.117 mA / 1.17 mA	0.025 mA / 0.25 mA	0.234 mA / 2.34 mA	0.05 mA / 0.5 mA
Accuracy	± 0.1% OF (SETTING + RANGE)				
<b>CR Mode</b> Range	0.16Ω~1.6~96,000Ω	0.16Ω~1.6~96,000Ω	0.16Ω~1.6~96,000Ω	0.16Ω~1.6~96,000Ω	0.16Ω~1.6~96,000Ω
Resolution	26.666μΩ / 0.010416mS	26.666μΩ / 0.010416mS	26.666μΩ / 0.010416mS	26.666μΩ / 0.010416mS	26.666μΩ / 0.010416mS
Accuracy	± 0.2% OF (SETTING + RANGE)				
<b>CV Mode</b> Range	0 ~ 8.01 ~ 81 V	0 ~ 8.01 ~ 81 V	0 ~ 60 ~ 500 V	0 ~ 8.01 ~ 81 V	0 ~ 60 ~ 500 V
Resolution	0.135 mV / 1.35 mV	0.135 mV / 1.35 mV	1 mV / 10 mV	0.135 mV / 1.35 mV	1 mV / 10 mV
Accuracy	± 0.05% OF (SETTING + RANGE)				
<b>CP Mode</b> Range	0 ~ 25.0 ~ 250.2 W	0 ~ 35.4 ~ 350.4 W	0 ~ 35.4 ~ 350.4 W	0 ~ 70.02 ~ 700.2 W	0 ~ 70.02 ~ 700.2 W
Resolution	0.417 mW / 4.17 mW	0.584 mW / 5.84 mW	0.584 mW / 5.84 mW	1.167 mW / 11.67 mW	1.167 mW / 11.67 mW
Accuracy	± 0.5% OF (SETTING + RANGE)				
<b>Surge Test</b> Current	0 ~ 50 A	0 ~ 70 A	0 ~ 15 A	0 ~ 140 A	0 ~ 30 A
Surge Time	10 ~ 1000 msec				
Surge Step	1 ~ 5				
<b>Battery Discharge Test</b> UPV	0 ~ 81 V	0 ~ 81 V	0 ~ 500 V	0 ~ 81 V	0 ~ 500 V
Time	1 ~ 99,999 secs				
Capacity	0 ~ 19,999.9 AH / 0 ~ 19,999.9 WH				
PROTECTION					
Over Power (OP)	262.5 W	367.5 W	367.5 W	735.0 W	735.0 W
Over Current (OC)	52.5 A	73.5 A	15.75 A	147.0 A	31.5 A
Over Voltage (OV)	84.0 V	84.0 V	525.0 V	84.0 V	525.0 V
Over Temperature (OT)	+85° C / +185° F				
DYNAMIC OPERATION					
T high & T low	50 μsec to 9.999 secs (20 kHz)				
Slew Rate	3.2-200 mA/μs 0.032~2 A/μs	4.64-290 mA/μs 0.0464~2.9 A/μs	1-62.5 mA/μs 10~625 mA/μs	0.0096-0.6 A/μs 0.096~6 A/μs	2-125 mA/μs 20~1250 mA/μs
Accuracy	± 5% OF SETTING ± 10 μs				
METERING - 5 1/2 Digit DVM					
<b>Voltage</b> Range	0 ~ 8.01 ~ 81 V	0 ~ 8.01 ~ 81 V	0 ~ 60 ~ 500 V	0 ~ 8.01 ~ 81 V	0 ~ 60 ~ 500 V
Resolution	0.135 mV / 1.35 mV	0.135 mV / 1.35 mV	1 mV / 10 mV	0.135 mV / 1.35 mV	1 mV / 10 mV
Accuracy	± 0.02% OF (READING + RANGE)				
<b>Current</b> Range	0 ~ 5.04 ~ 50.4 A	0 ~ 7.02 ~ 70.2 A	0~ 1.5 ~ 15 A	0 ~ 14.04 ~ 140.4 A	0 ~ 3.0 ~ 3.0 ~ 30.0 A
Resolution	0.084 mA / 0.84 mA	0.117 mA / 1.17 mA	0.025 mA / 0.25 mA	0.234 mA / 2.34 mA	0.05 mA / 0.5 mA
Accuracy	± 0.05% OF (READING + RANGE)				
ANALOG I/O					
Current Monitor (Non isolated)	5.04 A/V	7.02 A/V	1.5 A/V	14.04 A/V	3 A/V
GENERAL					
Short Circuit Resistance	0.018 Ω	0.0169 Ω	0.367 Ω	0.0053 Ω	0.087 Ω
Max. SC Current	50 A	70 A	15 A	140 A	30 A
Interfaces (standard)	USB, RS232				
AC Input / Pwr Consumption	100 ~ 240 Vac ± 10 % 50/60 Hz / 40 VA			100 ~ 240 Vac ± 10 % 50/60 Hz / 60 VA	
Operating Range   Cooling	0 - 40° C / 32 - 104° F, Advanced Fan Cooling				
Dimensions (H x W x D)	205 x 123 x 477 mm / 8.0" x 4.8" x 18.8"			205 x 231 x 480 mm / 8.0" x 9.0" x 18.9"	
Weight (Net)	5.3 kg / 11.7 lbs			10.3 kg / 22.7 lbs	
EMC & Safety	CE Mark				



## ORDERING INFORMATION:

### Line 1: DC Load Model:

Model	Description
41S0850	DC Load, 250W, 80V, 50A, Bench, USB & RS232 I/F
41S0870	DC Load, 350W, 80V, 70A, Bench, USB & RS232 I/F
41S5015	DC Load, 350W, 500V, 15A, Bench, USB & RS232 I/F
41S08140	DC Load, 700W, 80V, 140A, Bench, USB & RS232 I/F
41S5030	DC Load, 700W, 500V, 30A, Bench, USB & RS232 I/F

### Line 2: Add QCT Option as needed

External Option	Description	Compatible with
Opt QCT	Quick Charger Tester	41L, 42L and 41S



### 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:

AC Line Cord.

Certificate of Conformance

### Included with each 41S Series Load:

Item	41S 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).

### AMERICAS & INTL

PPST Solutions, Inc.  
Irvine, USA  
Phone: +1(888) 239-1619  
Email: sales@ppstsolutions.com

### EUROPE

Caltest Instruments GmbH.  
Kappelrodeck, Germany  
Phone: +49(0)7842-99722-00  
Email: info@caltest.de

### UNITED KINGDOM

Caltest Instruments, LTD.  
Hampshire, UK  
Phone: +44(0)1483 302 700  
Email: info@caltest.co.uk

### CHINA

PPST Shanghai Co. Ltd.  
Shanghai, China  
Phone: +86-21-6763-9223  
Email: info@ppst.com.cn



### PPST Solutions, Inc.

2802 Kelvin Avenue, Suite 100, Irvine CA 92614  
Direct: 888-239-1619 • Fax: 949-756-0838  
Email: sales@ppstsolutions.com  
www.ppstsolutions.com