

# KONSTANTER SPL 250-30 / SPL 400-40

## Programmable Electronic Load

3-349-701-03  
1/1.13

- 4 operating modes: constant current, constant voltage, constant load, constant power
- High speed sequence and transient measurement, short-circuit proof, battery discharging and other auxiliary functions
- Minimum operating voltage is less than 0.6 V at maximum current load.
- Programmable current rise and fall time, steep edges
- Several groups of parameters (device settings) and sequences (load profile) can be saved and retrieved.
- Floating power input / no grounding
- Safe electrical separation
- Input can be switched on and off.
- Voltage or current control is possible with constant power.
- Settings selected by means of rotary switch and keypad
- Multifunctional LCD panel
- Safety functions, amongst others adjustable power limiting
- Benchtop instrument, also suitable for mounting to a 19" rack



## Applications

Series SPL 250-30 and SPL 400-40 electronic loads are high precision direct current sinks for use in research, product development, production, service and vocational training. Two types are available with 250 and 400 W input power. The devices are distinguished by a diverse range of functions and excellent regulating accuracy, as well as outstanding ease of operation.

## Features

### High levels of operating safety thanks to safety functions and special functions

A multitude of protection and additional functions have been integrated, for example:

- Limiting of the setting ranges for voltage and current with adjustable response delay and reaction
- Overcurrent protection (OCP)
- Overvoltage protection (OVP)
- Power limiting
- Overtemperature protection
- Protection of the electronic load in the event of polarity reversal
- A highly effective, intelligent cooling system reduces system temperature and results in increased power density.
- The input connector terminals are especially well suited for large test current values.

### Multifunctionality

- Equipped with 4 basic operating modes: CC, CV, CR, CP
- Rapid transient measurement of the connected device under test with separate adjustment options for high/low level, rise and fall time
- Extensive sequential test functions with 10  $\mu$ s as the smallest step rate and 100,000 s as the largest step rate. Cyclical addresses can be freely selected and one sequence can be combined with another, in order to create even more complex test procedures.
- Short-circuit test, battery discharge test and other auxiliary functions
- Remote sensor connector sockets and trigger connector socket are included. The instrument is automatically switched to sensing mode operation as soon as the remote sensors are connected.
- 10 groups of parameter settings can be saved to memory, and the default settings stored to RAM (location 0) are activated automatically when the instrument is switched on.
- SCPI support makes it easy to set up an automatic test equipment system (ATE) which communicates with other programmable devices via the RS 232 port or the optional GPIB interface.

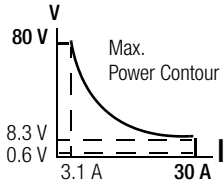
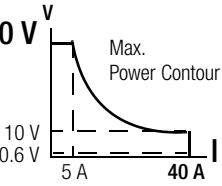
### Easy Operation

- Easy-to-configure sequence parameters in combination with extensive sequence editing functions
- Complete electronic calibration is possible without removing the slide-in unit.

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## Programmable Electronic Load

### Characteristic Values

Type	SPL 250-30	SPL 400-40
Article number	K852A	K853A
Input Ratings		
Front Load Input	1	1
Current	0 ... 30 A	0 ... 40 A
Voltage	0 ... 80 V	0 ... 80 V
Power <sup>1</sup>	250 W at 40 °C	400 W at 40 °C
Input Characteristics		
		
Minimum Operating Voltage @ Full Scale Current	0.6 V	0.6 V
Constant Current Mode (CC)		
<b>Low Range (CCL)</b>	0 ... 3 A	0 ... 4 A
Resolution	0.1 mA	0.1 mA
Accuracy	0.1% + 5 mA	0.1% + 5 mA
<b>High Range (CCH)</b>	0 ... 30 A	0 ... 40 A
Resolution	1 mA	1 mA
Accuracy	0.1% + 10 mA	0.1% + 10 mA
Constant Voltage Mode (CV)		
Range	0 ... 80 V	0 ... 80 V
Resolution	1 mV	1 mV
Accuracy	0.1% + 10 mV	0.1% + 10 mV
Constant Resistance Mode (CR)		
<b>Low Range (CRL)</b>	0.02 to 2 $\Omega$	0.02 to 2 $\Omega$
Resolution	0.1 m $\Omega$	0.1 m $\Omega$
Accuracy @ I > 4 A	0.5% + 12 m $\Omega$	0.5% + 12 m $\Omega$
<b>Middle Range (CRM)</b>	2 ... 200 $\Omega$	2 ... 200 $\Omega$
Resolution	8.6 $\mu\text{S}^2$	8.6 $\mu\text{S}$
Accuracy @ V > 8 V	0.3% + 1.25 mS	0.3% + 1.25 mS
<b>High Range (CRH)</b>	20 ... 2000 $\Omega$	20 ... 2000 $\Omega$
Resolution	0.96 $\mu\text{S}$	0.96 $\mu\text{S}$
Accuracy @ V > 8 V	0.3% + 0.625 mS	0.3% + 0.625 mS
Constant Power Mode (CP)		
Range	0 ... 250 W	0 ... 400 W
Resolution @ P < 100 W	1 mW	1 mW
Resolution @ P $\geq$ 100 W	10 mW	10 mW
Accuracy	0.2% + 600 mW	0.2% + 600 mW
Current Measurement		
<b>Low Range</b>	0 ... 3 A	0 ... 4 A
Resolution	0.1 mA	0.1 mA
Accuracy	0.05% + 4 mA	0.05% + 4 mA
<b>High Range</b>	0 ... 30 A	0 ... 40 A
Resolution	1 mA	1 mA
Accuracy	0.05% + 8 mA	0.05% + 8 mA
Voltage Measurement		
Range	0 ... 80 V	0 ... 80 V
Resolution	1 mV	1 mV
Accuracy	0.1% + 8 mV	0.1% + 8 mV
Power Measurement		
Range	0 ... 250 W	0 ... 400 W
Resolution @ P < 100 W	1 mW	1 mW
Resolution @ P $\geq$ 100 W	10 mW	10 mW

# KONSTANTER SPL 250-30 / SPL 400-40

## Programmable Electronic Load

Type	SPL 250-30	SPL 400-40
Article number	K852A	K853A
Accuracy	0.1% + 600 mW	0.1% + 600 mW
<b>Current Slew Rates</b>		
<i>Range CCH</i>	1 mA/μs ... 3 A/μs	1 mA/μs ... 4 A/μs
<i>Range CCL</i> <sup>3</sup>	100 μA/μs ... 300 mA/μs	100 μA/μs ... 400 mA/μs
Resolution	1 mA/μs	1 mA/μs
Accuracy <sup>4</sup>	3% + 10 μs	3% + 10 μs
<b>Transient Operation</b>		
Transient Mode	Continuous, pulse, toggled	Continuous, pulse, toggled
Frequency Range <sup>5</sup>	0.38 Hz ... 50 kHz	0.38 Hz ... 50 kHz
Highest/Lowest Time	0 ... 655.35 ms	0 ... 655.35 ms
Resolution	10 μs	10 μs
Accuracy	0.2% + 10 μs	0.2% + 10 μs
Rise/Fall Time	10 μs ... 655.35 ms	10 μs ... 655.35 ms
Resolution	10 μs	10 μs
Accuracy	0.2% + 10 μs	0.2% + 10 μs
<b>List Characteristics (Sequence)</b>		
Step Rate	10 μs ... 100,000 s	10 μs ... 100,000 s
Resolution	10 μs	10 μs
Accuracy	0.2% + 10 μs	0.2% + 10 μs
Number of Steps	1 ... 50	1 ... 50
Cycle	1 ... 65,535	1 ... 65,535
Storage Capacity	7 Lists	7 Lists
Expanded Functions	Chain	Chain
<b>Battery Discharge</b>		
<i>Discharge Time</i>	1 s ... 100 h	1 s ... 100 h
Resolution	1 s	1 s
Accuracy	0.2% + 1 s	0.2% + 1 s
<i>Battery Capacity</i>	1 mA ... 3000 Ah	1 mA ... 4000 Ah
Resolution	1 mAh	1 mAh
Accuracy	0.3% + 0.01 Ah	0.3% + 0.01 Ah
<b>Short Circuit</b>		
CCL Mode	3.3 A	4.4 A
CCH Mode	33 A	44 A
CV Mode	0 V	0 V
CRL Mode	0.0180 Ω	0.0180 Ω
CRM Mode	1.80 Ω	1.80 Ω
CRH Mode	18 Ω	18 Ω
CPV Mode	270 W	420 W
CPC Mode	0 W	0 W
<b>Maximum Slew Rate</b>		
Current	3 A/μs	4 A/μs
Voltage	0.6 V/μs	0.6 V/μs
<b>Programmable Open Circuit</b>	≥ 20 kΩ	≥ 20 kΩ
<b>Trigger Input</b>		
Trigger Level	TTL falling edge	TTL falling edge
Trigger Pulse Width	≥ 10 μs	≥ 10 μs
<b>Maximum Input Levels</b>		
Current	33 A	44 A
Voltage	84 V	84 V
<b>Protection Features</b>	OV, OC, OP, OT, RV	OV, OC, OP, OT, RV

# KONSTANTER SPL 250-30 / SPL 400-40

## Programmable Electronic Load

Type	SPL 250-30	SPL 400-40
Article number	K852A	K853A
Reverse Current Capacity		
Input OFF	25 A	30 A
Input ON	40 A	50 A
Ripple and Noise		
Current (rms/p-p)	3 mA / 30 mA	3 mA / 30 mA
Voltage (rms)	5 mV	5 mV
Environmental Conditions		
Temperature	0 ... 50 °C	0 ... 50 °C
Relative Humidity	≤ 85%	≤ 85%
Remote Interface <sup>6</sup>	RS232, GPIB	RS232, GPIB
Programming Language	SCPI	SCPI
Mains Input		
Supply Voltage	AC 115 V / AC 230 V +10/–15%	AC 115 V / AC 230 V +10/–15%
Line Frequency	48 ... 63 Hz	48 ... 63 Hz
Dimensions	213 mm x 104 mm x 391 mm	213 mm x 104 mm x 391 mm
Dimensions with rubber protection	226 mm x 110 mm x 414 mm	226 mm x 110 mm x 414 mm
Net Weight	5.8 kg	5.8 kg
Gross Weight (rubber protection included)	Approx. 6 kg	Approx. 6 kg

<sup>1</sup> Maximum continuous power available is derated linearly from 100% of maximum at 40 °C, to 75% of maximum at 55 °C.

<sup>2</sup> Conductance (S) = 1 / Resistance (Ω).

<sup>3</sup> The set level is 10 times larger than the slew rate in CCL mode.

<sup>4</sup> The actual transition time is defined as the time required for the input to change from 10% to 90% or from 90% to 10% of the programmed excursion.

<sup>5</sup> Transient frequency depends on the time for high/low level and rising/falling edge.

<sup>6</sup> Full remote control via RS 232 with optional GPIB.

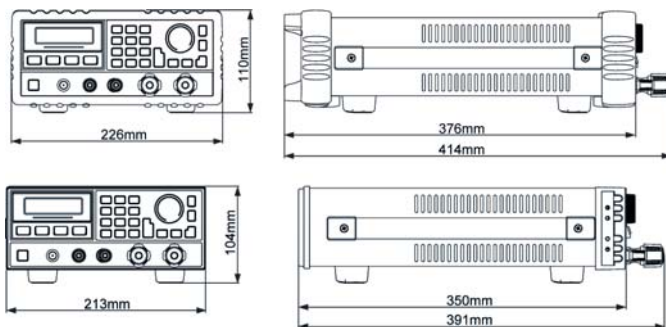
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## Programmable Electronic Load

### Data Interface

- Supports SCPI (standard commands for programmable instruments) and Labview, and can be operated with the required software.
- The firmware can be updated online.

### Dimensions



### Scope of Delivery

- 1 Benchtop instrument
- 1 Rubber protector
- 1 Condensed operating instructions
- 1 CD ROM with operating instructions (German and English)

### Views

#### Font Panel with Rubber Protection



#### Rear Panel with Rubber Protection and Optional GPIB interface



#### Input Terminals



### Order Information

Description	Type	Article Number
Single-channel electronic load with multifunctional digital display, with characteristic current, resistance, power and voltage curves, input: max. 80 V DC / max. 30 A / max. 250 W, supply power: 115/230 V AC 50/60 Hz, benchtop instrument also suitable for 19" rack mounting	KONSTANTER SPL 250-30	K852A
Single-channel electronic load with multifunctional digital display, with characteristic current, resistance, power and voltage curves, input: max. 80 V DC / max. 40 A / max. 400 W, supply power: 115/230 V AC 50/60 Hz, benchtop instrument also suitable for 19" rack mounting	KONSTANTER SPL 400-40	K853A

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