

## VMP-300 Boosters

Boosters for  
 SP200  
 SP240  
 SP300 2 Ch.  
 VSP300 6 Ch.  
 VMP300 16 Ch.

### HCV-3048

Current & voltage booster.

The unmatched combination of power and speed

Energy storage and conversion research presents new and challenging technical demands each and every day. Developments in **Batteries, Electrolyzer or Fuel Cells** require leading edge and laboratory proven diagnostic tools for meaningful real world test results.

The **HCV-3048** is designed for battery stack/pack characterizations. The continuous maximum current of  $\pm 30$  A for a single unit can be extended up to  $\pm 120$  A by connecting four units in parallel. The control voltage range is 0-48 V.

**Impedance spectroscopy (EIS)** provides valuable information on energy storage and conversion products, helping to identify the kinetic properties of multiple processes within the device under test. The **HCV-3048** brings unmatched insight to **high power** systems that has been unattainable until now.

#### Features

- Max current  $\pm 30$  A
- Voltage range 0-48 V
- EIS up to 500 kHz
- Stackable  $\pm 120$  A

### Internal boosters

High current and high voltage boosters.  
 From 1 pA to 150 A and from 5 V to 48 V

A range of internal boosters has been designed to increase the current and the voltage specifications of the **SP-300**, **VSP-300**, and **VMP-300**. Four models are available:  $\pm 1$  A/ $\pm 48$  V,  $\pm 2$  A/ $\pm 30$  V,  $\pm 4$  A/ $[-3;14]$  V,  $\pm 10$  A/ $[0;5]$  V.

Depending on the instrument chassis, several similar boosters can be connected in parallel to expand the maximum current of the system. This feature is available for the 2 A, 4 A and 10 A boosters.

#### Configurations

- $\pm 1$  A/ $\pm 48$  V
- $\pm 2$  A/ $\pm 30$  V
- $\pm 4$  A/ $[-3;14]$  V
- $\pm 10$  A/ $[0;5]$  V

#### Features

- Booster range included in the autoranging
- EIS capability up to 2 MHz
- Plug-in modules
- Plug-and-play
- 5-lead connection type
- Parallel boosters to increase the max current

## Boosters

high current and high voltage

### Specifications

	$\pm 1$ A/ $\pm 48$ V	$\pm 2$ A/ $\pm 30$ V	$\pm 4$ A/ $[-3;14]$ V	$\pm 10$ A/ $[1;6]$ V	$\pm 30$ A/ $[0;48]$ V
<b>Current</b>					
Compliance	$\pm 1$ A	$\pm 2$ A	$\pm 4$ A	$\pm 10$ A	$\pm 30$ A ( $\pm 120$ with 4 units)
Accuracy	< 2 mA on 1 A range	< 4 mA on 2 A range	< 8 mA on 4 A range	< 60 mA on 10 A range	< 240 mA on 30 A range
<b>Voltage</b>					
Compliance	$\pm 49$ V	$\pm 30$ V	-3 V ; +14 V	-1 ; +6 V	0 ; +48 V
Control	$\pm 48$ V	$\pm 30$ V	-3 V ; +10 V	-1 ; +6 V	0 ; +48 V
<b>Features</b>					
EIS frequencies	2 MHz - 10 $\mu$ Hz	1 MHz - 10 $\mu$ Hz	1 MHz - 10 $\mu$ Hz	1 MHz - 10 $\mu$ Hz	500 kHz - 10 $\mu$ Hz
Bandwidth [-3 dB]	> 2 MHz	> 3 MHz	> 4 MHz	> 8 MHz	800 kHz
Slew rate (no load)	> 15 V/ $\mu$ s	50 V/ $\mu$ s	50 V/ $\mu$ s	50 V/ $\mu$ s	> 20 V/ $\mu$ s
Rise/fall time (no load)	< 250 ns	< 200 ns	< 200 ns	< 200 ns	< 3 $\mu$ s
Floating mode	yes	yes	yes	yes	yes
Parallel ability	no	yes	yes	yes	yes up to 4
Connection	2, 3, 4, 5 leads	2, 3, 4, 5 leads	2, 3, 4, 5 leads	2, 3, 4, 5 leads	2, 3, 4 leads

Single potentiostats/galvanostats

Multi potentiostats/galvanostats

Boosters

High current instruments

Battery test stations

Software package

Fuel cell test stations

Materials & liquids test systems

Scanning systems

## VMP3 Boosters

Boosters for  
SP150  
VSP 5Ch.  
VMP3 16Ch

Electrical Energy Storage research presents new and challenging technical demands every day. Developments in Batteries, Hydrolyzer or Fuel Cells require leading edge and laboratory proven diagnosis tools for meaningful real world test results.

## FlexP0160

3kW Booster with flexible configuration, suitable for 48V battery packs. 4 Boosters up to 12 kW can be switched in parallels.

### Power EIS with FlexP0160

EIS provides valuable information about working electrical devices. It helps identify the kinetic properties of multiple processes within the device under test. FlexP0160 and Power EIS brings unmatched insight to very high-power units that have been out of reach until now.

The FlexP0160 Power Unit covers a full range of DC and AC test signals for devices in the 100's of amps and up to 100 volts range.

Driven by a VMP3 potentiostat/galvanostat, the FlexP0160 brings the best of electrochemistry knowledge and methods into the high power field.



### Features

- Voltages to 60 V
- Current to 50 A (up to 200 A)
- Up to 4 Parallel unit to 12 kW
- 10 kHz - 1 MHz EIS capable
- 3 kW continuous with water cooling
- 1.5 kW continuous with air cooling
- Cell temperature measurement included

## Internal & external Boosters

Deliver more power to your application with a high current booster

SP-150, VSP and VMP3 potentiostats can be interfaced to a separate current booster unit. These modular booster units can have different booster modules placed inside them (2, 5, 10, or 20 A). In the standard booster chassis there are 8 available booster slots and the current limit is 20 A. Each booster channel is connected to a potentiostat board.

There is an 80 or 100 A booster unit. The 80 A and 100 A booster exist also as a stand alone system (HCP-803, HCP-1005 see pages 15/16). One 4 A booster kit can be directly inserted in the VSP chassis.

### Configurations

- External:  $\pm 2$  A,  $\pm 5$  A,  $\pm 10$  A,  $\pm 20$  A on  $\pm 10$  V adjustable from  $-20$  to  $+20$  V  
 $\pm 80$  A on  $\pm 3$  V  
 $\pm 100$  A on (0.6 - 5) V
- Internal kit:  $\pm 4$  A on 20 V only for VSP

### Features

- Booster range included in the autoranging (for boosters up to 20 A)
- EIS capability
- Plug-in module or external chassis
- Plug-and-play
- 5-lead connection type

## Boosters

high current and high voltage

### Specifications

	2/4/5 A	10/20 A	80/100 A	FlexP0160
<b>Current</b>				
Maximum current	2 A: $\pm 2$ A, 4 A: $\pm 4$ A, 5 A: $\pm 5$ A	10 A: $\pm 10$ A, 20 A: $\pm 20$ A	80 A: $\pm 80$ A, 100 A: $\pm 100$ A	50 A up to 200 A (4 in parallel)
Current accuracy	2 A: $< 4$ mA on 2 A range, 4 A: $< 8$ mA on 4 A range, 5 A: $< 10$ mA on 5 A range	10 A: $< 20$ mA on 10 A range, 20 A: $< 40$ mA on 20 A range	80 A: $< 160$ mA on 80 A range, 100 A: $< 200$ mA on 100 A range	0.2% of value $\pm 0.1\%$ FSR
<b>Voltage</b>				
Compliance	adjustable $\pm 10$ V range	adjustable $\pm 10$ V range	80 A: $\pm 3$ V 100 A: 0.6 - 5 V	$\pm 50$ A: 2 - 58 V (water cooled)
Control voltage	$\pm 20$ V	$\pm 20$ V	$\pm 3/5$ V	[1; 60] V
<b>Features</b>				
Max frequency (accuracy 1%, 1°)	2 A: up to 150 kHz, 4 A: up to 130 kHz, 5 A: up to 120 kHz	10 A: up to 80 kHz, 20 A: up to 80 kHz	80 A: up to 15 kHz, 100 A: up to 10 kHz	10 kHz
Bandwidth	1 MHz	1 MHz	1 MHz	-
Rise time and fall time	15 $\mu$ s	25 to 60 $\mu$ s	95 $\mu$ s to 1.7 ms	$< 10$ $\mu$ s
Parallel ability	no	no	no	yes up to 4
Connection	2, 3, 4, 5 terminal leads	2, 3, 4, 5 terminal leads	2, 3, 4, 5 terminal leads	2, 3, 4 terminal leads
<b>General</b>				
1 external input	security to open circuit (TTL level)	security to open circuit (TTL level)	security to open circuit (TTL level) Emergency push button	embed (cell temperature and emergency)
Power	1,000 W	1,000 W	1,000 W	3,750 W
Chassis dimensions (W x D x H)	495 x 465 x 280 mm	495 x 465 x 280 mm	495 x 465 x 280 mm	450 x 550 x 133 mm (19 U x 3 U)
Chassis weight	24 kg	24 kg	24 kg	24 kg
Booster board weight	2 A: 1 kg, 4 A: 0.85 kg, 5 A: 1 kg	10 A: 2 kg, 20 A: 4.2 kg	80 A: 4.8 kg, 100 A: 9 kg	N/A

