

# Bipolar high voltage power supplies

## Series HCB from $\pm 1250$ V to $\pm 20000$ V / 1,4 W to 200 W



### Design example

**HCB 7 - 6500**  
 $\pm 6500$  V /  $\pm 1$  mA

#### Features:

- Light-weight
- In units with 6,5kV and higher the HV-components are moulded in (removable) silicon resin
- Short-circuit and flash over proof.
- Unlimited operation with rated current in a short-circuit condition
- Voltage regulation and current limitation with automatic, sharp transition, control modes indicated by LEDs
- Voltage adjustment with 10-turn potentiometers with precision scale; the adjusting knob can be locked
- $4\frac{1}{2}$  digit DVM for voltage and current (for table-top models)
- Set point adjustment possible with locked output, release of output voltage by means of an "ON" / "OFF" switch
- 4- quadrant operation possible also for active loads and unlimited power sinking
- Suitable for capacitive and resistive loads

#### Function:

Bipolar HV power supplies consist of 2 switch-mode controlled HV sources which are connected to the output. In principle, the rectified line voltage in each source drives a square wave generator of fixed frequency, whose AC voltage is transformed, rectified and filtered, producing the positive or negative output voltage. For regulation, the square wave voltage is pulse width modulated. The operation is contra-moving, and the output can be adjusted with continuous zero crossing.

#### Design:

- 19" table-top case (19" rack adaptors available)

#### Output:

- Output isolation:  
One output terminal each leads the high voltage, the "0V" terminal is connected firmly to earth. If required, the "0V" terminal can be made floating against earth up to  $\pm 300$  V.
- Output terminals:  
All output terminals are located at the rear plate of the unit. High voltage connectors with the appropriate dielectric strength are delivered with the power supply

#### Technical Data:

- Mains connection:  
Up to 700W nominal power:  
230V  $\pm 10\%$  47Hz to 63Hz  
For 1400W nominal power and more:  
400V  $\pm 10\%$  47Hz to 63Hz, three phase
- Ambient temperature:  
0°C to +40°C

The following data applies for voltage regulation, and refers to the rated value (unless otherwise stated). (For explanations please refer to Definitions and Terms on page 54.)

- Setting range:  
from -100% to +100%
- Setting resolution:  
 $\pm 1 \times 10^{-4}$
- Residual ripple (0 - 10 MHz):  
 $< 3 \times 10^{-4}$  pp + 50mVpp, typ.  $2 \times 10^{-4}$  pp
- Recovery time for voltage control:  
 $< 1$  ms for load changes from 10% to 90% or from 90% to 10%

- Setting time at nominal load:  
 $< 200$  ms
- Deviation:  
For  $\pm 10\%$  mains voltage variation:  
 $< \pm 2 \times 10^{-5}$   
For no load / full load:  
 $< 2 \times 10^{-4}$   
over 8 hours under constant conditions:  
 $< \pm 2 \times 10^{-4}$   
within the temperature range:  
 $< \pm 2 \times 10^{-4}$  /K

#### Possible Options:

- Analog programming (see page 44)
- Analog programming, floating (see page 44)
- Computer interfaces - IEEE 488, RS 232, RS 422, Profibus DP, USB, LAN (more on request) (see page 46)
- Lower ripple (see page 48)
- Higher stability (see page 48)
- Lower stored energy and shorter recovery time (see page 48)

More options and special solutions on request. Some options may involve changes to the description of the unit - especially concerning the mechanical design.

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Type	Voltage	Current	Width	Height	Depth	Weight
HCB 1,4 - 1250	0 - $\pm 1250$ V	0 - $\pm 1$ mA	19" / 443 mm	3 U / 133 mm	350 mm	6 kg
HCB 14 - 1250	0 - $\pm 1250$ V	0 - $\pm 10$ mA	19" / 443 mm	3 U / 133 mm	350 mm	7 kg
HCB 2 - 2000	0 - $\pm 2000$ V	0 - $\pm 1$ mA	19" / 443 mm	3 U / 133 mm	350 mm	6 kg
HCB 20 - 2000	0 - $\pm 2000$ V	0 - $\pm 10$ mA	19" / 443 mm	3 U / 133 mm	350 mm	9 kg
HCB 3,5 - 3500	0 - $\pm 3500$ V	0 - $\pm 1$ mA	19" / 443 mm	3 U / 133 mm	350 mm	7 kg
HCB 35 - 3500	0 - $\pm 3500$ V	0 - $\pm 10$ mA	19" / 443 mm	3 U / 133 mm	450 mm	10 kg
HCB 7 - 6500	0 - $\pm 6500$ V	0 - $\pm 1$ mA	19" / 443 mm	3 U / 133 mm	350 mm	10 kg
HCB 70 - 6500	0 - $\pm 6500$ V	0 - $\pm 10$ mA	19" / 443 mm	3 U / 133 mm	550 mm	15 kg
HCB 14 - 12500	0 - $\pm 12500$ V	0 - $\pm 1$ mA	19" / 443 mm	3 U / 133 mm	350 mm	30 kg
HCB 140 - 12500	0 - $\pm 12500$ V	0 - $\pm 10$ mA	19" / 443 mm	6 U / 266 mm	550 mm	42 kg
HCB 20 - 20000	0 - $\pm 20000$ V	0 - $\pm 1$ mA	19" / 443 mm	6 U / 266 mm	550 mm	35 kg
HCB 200 - 20000	0 - $\pm 20000$ V	0 - $\pm 10$ mA	19" / 443 mm	6 U / 266 mm	550 mm	45 kg

On request, we deliver power supplies of this type with different voltage or power ranges.

Mating high voltage connectors for units are included in the scope of delivery. Mating high voltage cables you'll find beginning with page 51.