

High voltage power supplies

Series HCP from 3,5 kV to 150 kV / 14 W to 4200 W



Design example

HCP 140 - 12500
12500V / 10mA

Features:

- Compact size and light weight
- Efficiency approx. 90%
- For units from 12.5kV nominal voltage on, all HV components are moulded in (removable) silicon
- Short-circuit & flashover proof
- Unlimited operation with rated current in a short-circuit condition
- Unlimited operation with rated power
- Voltage and current regulation with automatic sharp transition, indicated by LEDs
- Adjustable overvoltage protection (limitation of set value)
- 4½ digit DVM's for voltage and current for all models
- Voltage and current setting by means of 10-turn potentiometers with precision scale; the adjusting knob can be locked
- Indication of set point values by means of button for switch-over of the displays
- Set point adjustment possible with locked output, release of output voltage by means of "ON" / "OFF" switch
- Suitable also for inductive and capacitive loads
- Suitable for photomultipliers

Function:

In principle, the rectified line voltage drives a square wave generator of fixed frequency, whose AC voltage is transformed, rectified and filtered, producing the output voltage. For regulation, the square wave voltage is pulse width modulated.

A low residual ripple of the output voltage, together with a high stability, high regulation speed and a low stored energy are all achieved by virtue of the high switching frequency.

Design:

- ½19" or 19" table-top case (depending on output voltage and power).
- 19" Rack-adapters for mounting into a 19" rack are available as accessory.

Output:

- Output isolation:
The required output polarity must be stated with the order. The requested output polarity will then be available at the HV connector and the "0V" terminal will be firmly connected to earth.
If required, the "0V" terminal can be made floating against earth up to ± 300V. A polarity reversal switch is optionally available.

Output terminals:

All output terminals are located at the rear side of the unit. High voltage connectors with the appropriate dielectric strength are delivered with the power supply.

For nominal voltage of 65kV and higher the HV- plug will be delivered ready mounted to 3m cable.

Technical Data:

Mains connection:

up to 1400W nominal power:
230V ±10% 47Hz to 63Hz

for 2800W and higher:
400V ±10% 47Hz to 63Hz, three-phase

Ambient temperature:

0°C to +40°C

Deviation:

- for ±10% mains voltage variation:
<± 1 × 10⁻⁵
for no load / full load:
<2 × 10⁻⁴
over 8 h under constant conditions:
<±1 × 10⁻⁴
within the temperature range:
<±1,5 × 10⁻⁴ / K

The following data applies for voltage and current regulation, and refers to the rated value (unless otherwise stated):
(For explanations please refer to Definitions and Terms on page 61.)

- Setting range:
from approx. 0,1% to 100%
- Setting resolution:
±1 × 10⁻⁴
- Residual ripple:
<1 × 10⁻⁴pp + 50mVpp,
typ. 5 × 10⁻⁵pp
- Recovery time:
Voltage control:
<1ms for load changes from 10% to 100% or from 100% to 10%
- Current control:
<10ms for load changes causing an output change of less than 10% of the rated voltage
- Setting time at nominal load:
<500ms for changes of the output voltage from 10% to 90% or 90% to 10%
- Discharging time constant for output without load:
approx. 2sec. to 10sec., depending on type

Possible Options:

- Coarse/fine-potentiometers (99% / 1%) for more accurate adjustment of voltage and / or current
- Analogue programming (see page 52)
- Analogue programming, floating (see page 52)
- Computer interface - IEEE 488, RS 232, RS 422, Profibus DP (more on request) (see page 54)
- electronically controlled polarity reversal switch (Up to 35kV remotely controllable when ordered with a programming or interface, please ask us for higher voltages.) Please specify the output polarity, when ordering without polarity reversal switch. (see page 56)
- Lower ripple (see page 56)
- Higher stability (see page 56)
- Lower stored energy (see page 56)
- Power limitation (see page 56)

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
HCP 14 - 3500 ●	0 - 3500 V	0 - 4 mA	½19" / 222 mm	3 U / 133 mm	350 mm	3 kg
HCP 35 - 3500 ●	0 - 3500 V	0 - 10 mA	½19" / 222 mm	3 U / 133 mm	350 mm	4 kg
HCP 140 - 3500 ●	0 - 3500 V	0 - 40 mA	½19" / 222 mm	3 U / 133 mm	350 mm	6 kg
HCP 350 - 3500 ●	0 - 3500 V	0 - 100 mA	½19" / 222 mm	3 U / 133 mm	450 mm	7 kg
HCP 700 - 3500 ●	0 - 3500 V	0 - 200 mA	19" / 443 mm	3 U / 133 mm	350 mm	11 kg
HCP 1400 - 3500	0 - 3500 V	0 - 400 mA	19" / 443 mm	3 U / 133 mm	450 mm	13 kg
HCP 2800 - 3500 3)	0 - 3500 V	0 - 800 mA	19" / 443 mm	3 U / 133 mm	550 mm	25 kg
HCP 4200 - 3500 3)	0 - 3500 V	0 - 1,2 A	19" / 443 mm	5 U / 221 mm	550 mm	35 kg
HCP 14 - 6500 ●	0 - 6500 V	0 - 2 mA	½19" / 222 mm	3 U / 133 mm	350 mm	3 kg
HCP 35 - 6500 ●	0 - 6500 V	0 - 5 mA	½19" / 222 mm	3 U / 133 mm	350 mm	4 kg
HCP 140 - 6500 ●	0 - 6500 V	0 - 20 mA	½19" / 222 mm	3 U / 133 mm	350 mm	6 kg
HCP 350 - 6500 ●	0 - 6500 V	0 - 50 mA	½19" / 222 mm	3 U / 133 mm	450 mm	7 kg
HCP 700 - 6500 ●	0 - 6500 V	0 - 100 mA	19" / 443 mm	3 U / 133 mm	350 mm	11 kg
HCP 1400 - 6500	0 - 6500 V	0 - 200 mA	19" / 443 mm	3 U / 133 mm	450 mm	13 kg
HCP 2800 - 6500 3)	0 - 6500 V	0 - 400 mA	19" / 443 mm	3 U / 133 mm	650 mm	25 kg
HCP 4200 - 6500 3)	0 - 6500 V	0 - 600 mA	19" / 443 mm	5 U / 221 mm	650 mm	35 kg
HCP 14 - 12500 ●	0 - 12500 V	0 - 1 mA	½19" / 222 mm	3 U / 133 mm	350 mm	4 kg
HCP 35 - 12500 ●	0 - 12500 V	0 - 2,5 mA	½19" / 222 mm	3 U / 133 mm	350 mm	5 kg
HCP 140 - 12500 ●	0 - 12500 V	0 - 10 mA	½19" / 222 mm	3 U / 133 mm	350 mm	7 kg
HCP 350 - 12500 ●	0 - 12500 V	0 - 25 mA	19" / 443 mm	3 U / 133 mm	450 mm	11 kg
HCP 700 - 12500 ●	0 - 12500 V	0 - 50 mA	19" / 443 mm	3 U / 133 mm	550 mm	16 kg
HCP 1400 - 12500	0 - 12500 V	0 - 100 mA	19" / 443 mm	3 U / 133 mm	650 mm	21 kg
HCP 2800 - 12500 3)	0 - 12500 V	0 - 200 mA	19" / 443 mm	5 U / 221 mm	650 mm	35 kg
HCP 4200 - 12500 3)	0 - 12500 V	0 - 300 mA	19" / 443 mm	6 U / 266 mm	650 mm	45 kg
HCP 14 - 20000 ●	0 - 20000 V	0 - 0,6 mA	½19" / 222 mm	3 U / 133 mm	350 mm	4 kg
HCP 35 - 20000 ●	0 - 20000 V	0 - 1,5 mA	½19" / 222 mm	3 U / 133 mm	350 mm	5 kg
HCP 140 - 20000 ●	0 - 20000 V	0 - 6 mA	½19" / 222 mm	3 U / 133 mm	350 mm	7 kg
HCP 350 - 20000 ●	0 - 20000 V	0 - 15 mA	19" / 443 mm	3 U / 133 mm	450 mm	11 kg
HCP 700 - 20000 ●	0 - 20000 V	0 - 30 mA	19" / 443 mm	3 U / 133 mm	550 mm	16 kg
HCP 1400 - 20000	0 - 20000 V	0 - 60 mA	19" / 443 mm	3 U / 133 mm	650 mm	21 kg
HCP 2800 - 20000 3)	0 - 20000 V	0 - 120 mA	19" / 443 mm	5 U / 221 mm	650 mm	35 kg
HCP 4200 - 20000 3)	0 - 20000 V	0 - 200 mA	19" / 443 mm	6 U / 266 mm	650 mm	45 kg
HCP 35 - 35000 ●	0 - 35000 V	0 - 1 mA	19" / 443 mm	3 U / 133 mm	450 mm	10 kg
HCP 140 - 35000 ●	0 - 35000 V	0 - 4 mA	19" / 443 mm	3 U / 133 mm	450 mm	11 kg
HCP 350 - 35000 ●	0 - 35000 V	0 - 10 mA	19" / 443 mm	3 U / 133 mm	450 mm	12 kg
HCP 700 - 35000	0 - 35000 V	0 - 20 mA	19" / 443 mm	3 U / 133 mm	550 mm	17 kg
HCP 1400 - 35000	0 - 35000 V	0 - 40 mA	19" / 443 mm	3 U / 133 mm	650 mm	25 kg
HCP 2800 - 35000 3)	0 - 35000 V	0 - 80 mA	19" / 443 mm	5 U / 221 mm	650 mm	45 kg
HCP 4200 - 35000 3)	0 - 35000 V	0 - 120 mA	19" / 443 mm	7 U / 310 mm	650 mm	50 kg

3) Three phase mains connection
● short term delivery

Mating high voltage connectors are included in the scope of delivery.
Mating high voltage cables you'll find beginning with page 59.

All units up to 35kV optionally available with electronically controlled polarity reversal switch.

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Type	Voltage	Current	Width	Height	Depth	Weight
HCP 35 - 65000	0 - 65000 V	0 - 0,5 mA	19" / 443 mm	3 U / 133 mm*	450 mm**	17 kg
HCP 140 - 65000	0 - 65000 V	0 - 2 mA	19" / 443 mm	3 U / 133 mm*	450 mm**	21 kg
HCP 350 - 65000	0 - 65000 V	0 - 5 mA	19" / 443 mm	6 U / 266 mm*	450 mm**	45 kg
HCP 700 - 65000	0 - 65000 V	0 - 10 mA	19" / 443 mm	8 U / 355 mm	550 mm	55 kg
HCP 1400 - 65000	0 - 65000 V	0 - 20 mA	19" / 443 mm	8 U / 355 mm*	550 mm**	65 kg
HCP 2800 - 65000 3)	0 - 65000 V	0 - 40 mA	19" / 443 mm	8 U / 355 mm*	550 mm**	70 kg
HCP 140 - 100000	0 - 100000 V	0 - 1 mA	19" / 443 mm	5 U / 221 mm	550 mm	50 kg
HCP 350 - 100000	0 - 100000 V	0 - 3 mA	19" / 443 mm	5 U / 221 mm	550 mm	55 kg
HCP 700 - 100000	0 - 100000 V	0 - 6 mA	19" / 443 mm	8 U / 355 mm	550 mm	73 kg
HCP 1400 - 100000	0 - 100000 V	0 - 12 mA	19" / 443 mm	8 U / 355 mm	550 mm	90 kg
HCP 140 - 150000	0 - 150000 V	0 - 0,5 mA	19" / 443 mm	8 U / 355 mm	750 mm	110 kg
HCP 350 - 150000	0 - 150000 V	0 - 2 mA	19" / 443 mm	8 U / 355 mm	750 mm	130 kg
HCP 700 - 150000	0 - 150000 V	0 - 4 mA	19" / 443 mm	8 U / 355 mm	750 mm	140 kg

3) Three phase mains

- short term delivery

Mating high voltage connectors are included in the scope of delivery.
Mating high voltage cables you'll find beginning with page 59.

All units with 65kV optionally available with manually operated polarity reversal switch. For orders without polarity switch please state the required output polarity.

*) With polarity reversal switch these units will be 2U higher.

**) With polarity reversal switch these units will be 100 mm deeper.