

1.4kW Bench mount /
Full rack

AC-HVDC
power supplies 

The HCP1K4 series power supplies are highly stable switch-mode power supplies with low ripple. Due to the high switching frequency the power supply has a low residual ripple in the generated output voltage with high stability, good regulation dynamics, and at the same time only a low amount of stored energy.

The HV output's polarity is positive or negative; a reverse polarity switch is optionally available. The power supplies can be operated in the local, analog (optional) and digital (optional) operating modes.



Features

- ▶ 0-3.5kV to 0-300kV output models
- ▶ Single phase AC input
- ▶ Continuous operation at full rated power
- ▶ Unlimited operation with rated current in short circuit condition
- ▶ Multi-function control panel with user friendly interface
- ▶ Digital and/or analog interface option
- ▶ Suitable for inductive and capacitive loads
- ▶ Manual voltage and current control with digital display
- ▶ Set-point display via a button
- ▶ Set-point adjustment possible with disabled output
- ▶ Push-button switch for output voltage
- ▶ Adjustable overvoltage limit
- ▶ Low ripple
- ▶ CE marked, EN61010-1 safety compliant
- ▶ Short circuit & arc protection
- ▶ 2 year warranty

Benefits

- ▶ Provides maximum device control & flexibility
- ▶ Safe operation ensures maximum protection to the power supply
- ▶ High voltage release included for safe operation at high voltage output
- ▶ User friendly controls combined with simple terminal software gives greater flexibility
- ▶ Special solutions are available, visit our [more resources](#) section to see our full range of options

Applications



- ▶ Capacitor / Insulation testing
- ▶ Electrostatics
- ▶ Gas discharge / Plasma
- ▶ High voltage test stands
- ▶ Ion sources
- ▶ Laboratory power
- ▶ Nuclear fusion research
- ▶ Particle accelerators
- ▶ Photomultiplier / Secondary electron multiplier
- ▶ Sputtering

Dimensions

Click the link to the dimensions table

→ [mechanical details](#)

More resources

Click the link or scan the code

→ xppower.com



Models & ratings

Model number	Polarity	Output voltage	Output current	Input voltage	Frequency	Connector	HV-cable
HCP3.5P400S	Positive	0 to +3.5kV	0 to 400mA	230VAC, ±10%	47 to 63Hz	SHV-10	RG 58
HCP3.5N400S	Negative	0 to -3.5kV					
HCP3.5R400S	Reversible	0 to 3.5kV					
HCP6.5P200S	Positive	0 to +6.5kV	0 to 200mA	230VAC, ±10%	47 to 63Hz		
HCP6.5N200S	Negative	0 to -6.5kV					
HCP6.5R200S	Reversible	0 to 6.5kV					
HCP012P100S	Positive	0 to +12.5kV	0 to 100mA	230VAC, ±10%	47 to 63Hz	HS 21	130 660
HCP012N100S	Negative	0 to -12.5kV					
HCP012R100S	Reversible	0 to 12.5kV					
HCP020P060S	Positive	0 to +20kV	0 to 60mA	230VAC, ±10%	47 to 63Hz		
HCP020N060S	Negative	0 to -20kV					
HCP020R060S	Reversible	0 to 20kV					
HCP035P040S	Positive	0 to +35kV	0 to 40mA	230VAC, ±10%	47 to 63Hz	F 3430	RG 11
HCP035N040S	Negative	0 to -35kV					
HCP035R040S	Reversible	0 to 35kV					
HCP065P020S	Positive	0 to +65kV	0 to 20mA	230VAC, ±10%	47 to 63Hz	KS 160	C 2124
HCP065N020S	Negative	0 to -65kV					
HCP065R020S	Reversible	0 to 65kV					
HCP100P012S	Positive	0 to +100kV	0 to 12mA	230VAC, ±10%	47 to 63Hz	B100KTOI	C 2124
HCP100N012S	Negative	0 to -100kV				on request	on request
HCP100R012S	Reversible	0 to 100kV					
HCP150P008S	Positive	0 to +150kV	0 to 8mA	230VAC, ±10%	47 to 63Hz	B150KTOI	C 2121
HCP150N008S	Negative	0 to -150kV				on request	on request
HCP150R008S	Reversible	0 to 150kV					

Devices with voltages up to 300kV available on request. Please [contact us](#).

Notes:

1. For further information, please refer to the [cables & connectors](#) guide.

Options

- Analog programming/interface
- Analog programming/interface, floating
- Computer interfaces IEEE 488, RS 232, RS 422, RS 485, Profibus, USB, LAN (more on request)

For further information about options and special solutions, please click on any of the links below:

Special solutions & modifications

Analog programming & interfaces

Digital programming & interfaces

→ [view options](#)

→ [view options](#)

→ [view options](#)

Or consult XP Power Sales directly.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage	See models and ratings table				
Efficiency		90		%	
Overvoltage category		II			
Protection class		I			
Input connector	For outputs up to 6.5kV; IEC 60320-1 C20 receptacle. For outputs from 12.5kV up to 300kV; mains input with fixed installed cable				
Input fuse	C9 16A 2-pol				
Input cable	For outputs up to 6.5kV: single phase mains with CEE 7/7 For outputs from 12.5kV up to 300kV: 3m single phase mains open end				

Output

Characteristic	Notes & conditions
Output voltage range	See models and ratings table
Output current range	See models and ratings table
Output control	Continuous adjustment from 0 to rated voltage/current by front panel mounted potentiometers
Output polarity	See models and ratings table
Output isolation	"0V" terminal is connected to the PE (EARTH), Current return preferably takes place via the shield of the output cable
HV output connection	Mating HV connector and 3m cable supplied
Voltage control	<1ms with load changes from 10% to 100% or 100% to 10%, respectively
Voltage setting range	Using the VOLTAGE potentiometer, approx. 0.1% to 100% of the rated value
Current control	<10ms with load changes that effect a change of less than 10% in the output voltage
Current setting range	Using the CURRENT potentiometer, approx. 0.1% to 100% of the rated value
Setting time at rated load	Typical 500ms, depending on type, for changes in the output voltage from 10% to 90% or 90% to 10%, respectively
Set point resolution	< $\pm 1 \times 10^{-3}$ of rated value with potentiometer on front panel < $\pm 1 \times 10^{-5}$ of rated value with option fine potentiometer with option interface 16-bit resolution including sign bit (max. 22bit)
Discharge time constant	With output free of load, max. 10s
Accuracy	Voltage: < $\pm 0.2\%$ of the nominal value Current: within the range of >5mA up to <200A: $\pm 0.2\%$ of the nominal value Outside the above mentioned range: < $\pm 0.5\%$ of the nominal value Additional digital display error < ± 2 digits
Residual ripple	< 1×10^{-4} pp +50mVpp (peak to peak), typ. 5×10^{-5} pp of rated value (measuring band width 30Hz to 10MHz) < 3×10^{-5} , typ. < 1.5×10^{-5} of rated value RMS
Control deviation	$\pm 10\%$ mains voltage variation: < $\pm 1 \times 10^{-5}$ of the rated value Open circuit / full load: 2×10^{-4} of the rated value Over 8 hours: < $\pm 1 \times 10^{-4}$ of the rated value Temperature deviations < $\pm 1.5 \times 10^{-4}$ /K of the rated value
Short circuit protection	The power supply is short circuit and arc proof. The maximum current can be drawn at any output voltage, even in the event of a short circuit.

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Temperature operation	0		+40	°C	
Storage temperature	-20		+50	°C	
Humidity - operation	0		+80	%	Up to +31°C, decreasing linearly down to 50% RH at 40°C
Humidity - storage	0		+80	%	No precipitation, dust-free and dry
Operating altitude	0		2000	m	Above sea level
Pollution degree		1			
Ingress protection	IP20				
Operation location	Only for use in dry indoor areas				

Signals & controls

	Function
Front panel	Voltage and current potentiometer, power switch, HV ON/OFF switch, digital display for current and voltage, voltage limit potentiometer. Display of the output voltage and current set points is possible with the SET VALUES push-button.
Operating modes	The HV output's polarity is positive, negative; or reversible (see Models & ratings table). The power supplies can be operated in the LOCAL, ANALOG (optional) and DIGITAL (optional) operating modes.

EMC: immunity & emissions

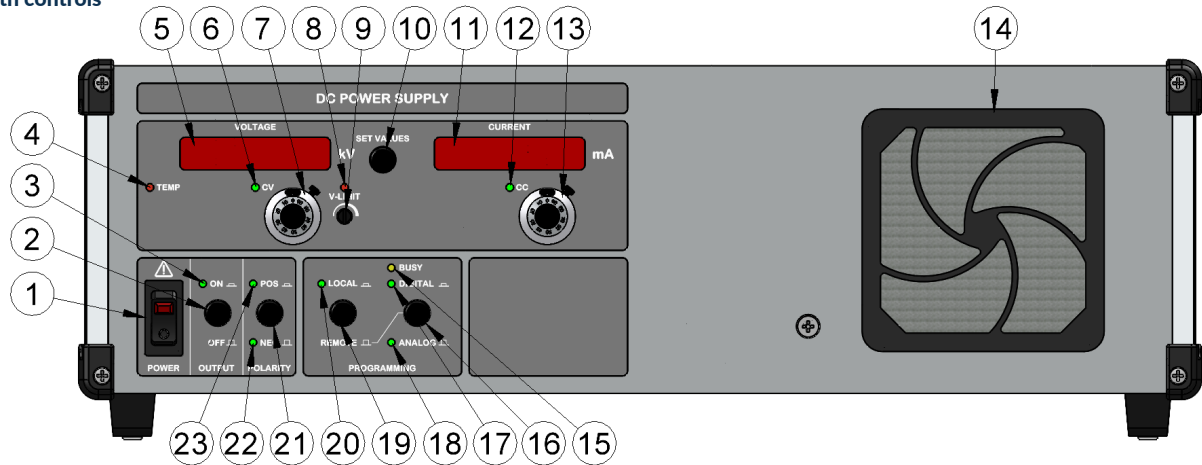
Phenomenon	Standard	Notes & conditions
Immunity	EN61000-6-2	Standard for industrial environments
Emissions	EN61000-6-4	Standard for industrial environments

Safety standard

Safety agency	Safety standard	Notes & conditions
EN	EN61010-1	
CE	Meets all applicable directives	

Mechanical details

Front view with controls



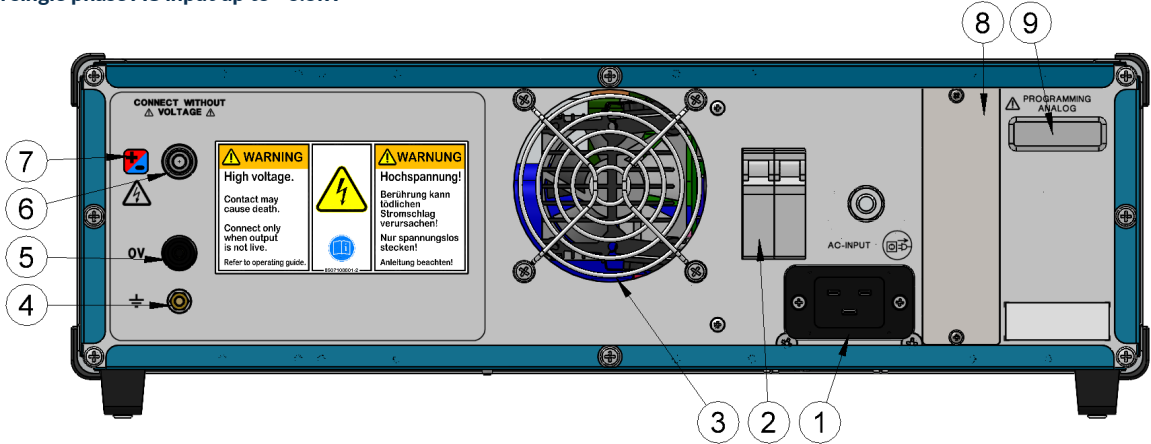
Example: HCP with dimensions: width 19"/443mm; height 3U/133mm

Front panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

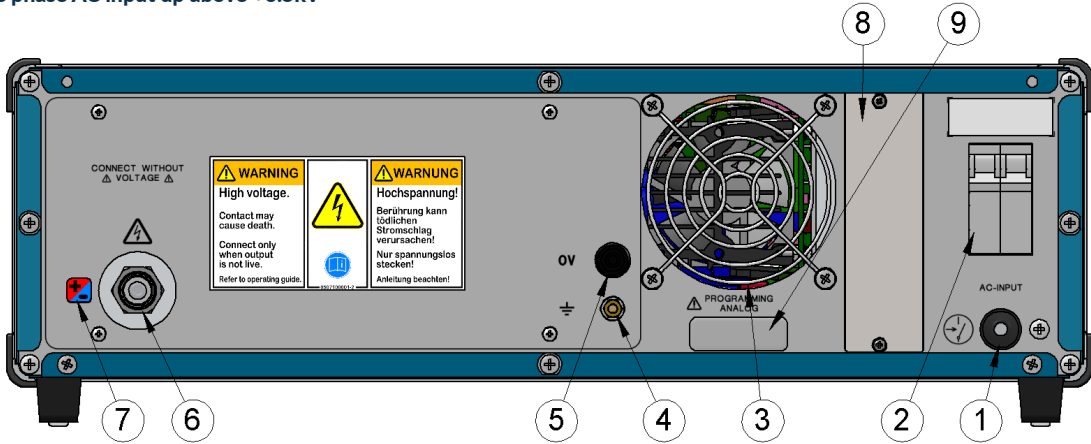
Number	Function	Number	Function
1	POWER switch (AC) with indicator light. Disconnects the power supply from the mains, two-pole switching.	13	Current adjustment: Ten-turn potentiometer with lockable precision dial.
2	OUTPUT switch (DC):Disconnects the DC output. Equipment remains live!	14	Air inlet for Fan.
3	ON LED: DC output ON. Illuminated green when the controller and power stage are ON.	15	BUSY LED Illuminated yellow indicating data traffic on the digital interface. (Optional)
4	TEMP LED: Illuminated red indicating overtemperature. Internal temperature too high, fan failed or airflow blocked.	16	DIGITAL/ANALOG operation mode switch: Switches between REMOTE/ANALOG mode and REMOTE/DIGITAL mode. (Optional)
5	VOLTAGE display: Indicating actual value. Displays set point when flashing.	17	DIGITAL LED: Illuminated green indicating digital programming active. (Optional)
6	CV LED: Illuminated green indicating constant voltage mode.	18	ANALOG LED: Illuminated green indicating analog programming active. (Optional)
7	Voltage adjustment: Ten-turn potentiometer with lockable precision dial.	19	LOCAL/REMOTE operation mode switch: Switches between LOCAL mode and REMOTE mode. (Optional)
8	V-LIMIT LED Illuminated red for active voltage set-point limit.	20	LOCAL LED: Illuminated green indicating LOCAL control mode active. (Optional)
9	V-LIMIT Set-point limitation adjustment for voltage (can only be operated with a screwdriver).	21	POLARITY switch: Local output polarity adjustment (Optional) Without polarity reversal, polarity labelled using colored stickers: RED: POSITIVE; BLUE: NEGATIVE
10	SET VALUES switch: Switches displays between Set-point mode and Actual output mode.	22	NEG LED set for negative output voltage. (Optional reverse polarity switch)
11	CURRENT display Indicating actual value. Displays set point when flashing.	23	POS LED set for positive output voltage. (Optional reverse polarity switch)
12	CC LED: Illuminated green indicating constant current control mode.		

Mechanical details

Rear view with single phase AC input up to +6.5kV



Rear view with single phase AC input up above +6.5kV



Example: HCP with polarity reversal switch and dimension: width 19"/443mm; height 3U/133mm

Rear panel shown for illustrative purposes only, dimensions and layout differ by power rating - see mechanical details table.

Number	Function	Number	Function
1	AC input up to 6,5kV C20 mains cable in accordance with IEC 60320-1, for higher voltage mains input with fixed installed cable.	6	HV output (dedicated for screened HV- cable with grounded shield, which can be used for current return).
2	Automatic main circuit breaker, fuse holder.	7	Polarity indication: RED: POSITIVE BLUE: NEGATIVE RED/BLUE: REVERSE POLARITY SWITCH
3	Air outlet for the power output stage.	8	Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...). (Optional)
4	Earth bolt: This connection must be connected to the ground of the load!	9	15-pin D-Sub connector for analog programming/interface. (Optional)
5	0V load connection, internally connected to the 0V of the electronics. This 0V connection is permanently connected to the protective conductor (PE).		

Mechanical details

Model Number	Mounting	Width		Height		Depth	Weight ⁽²⁾
HCP3.5P400S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP3.5N400S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP3.5R400S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP6.5P200S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP6.5N200S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP6.5R200S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	450mm	13kg
HCP012P100S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP012N100S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP012R100S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP020P060S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP020N060S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP020R060S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP035P040S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP035N040S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP035R040S	Bench mount ⁽¹⁾	19"	443mm	3U	133mm	650mm	25kg
HCP065P020S	Bench mount ⁽¹⁾	19"	443mm	8U	355mm	550mm	65kg
HCP065N020S	Bench mount ⁽¹⁾	19"	443mm	8U	355mm	550mm	65kg
HCP065R020S	Bench mount ⁽¹⁾	19"	443mm	8U	355mm	650mm	75kg
HCP100P012S	Mini rack	19"	553mm	12U	535mm	900mm	150kg
HCP100N012S	Mini rack	19"	553mm	12U	535mm	900mm	150kg
HCP100R012S	Mini rack	19"	553mm	12U	535mm	900mm	150kg
HCP150P008S	Mini rack	19"	553mm	12U	535mm	900mm	160kg
HCP150N008S	Mini rack	19"	553mm	12U	535mm	900mm	160kg
HCP150R008S	Mini rack	19"	553mm	12U	535mm	900mm	160kg

Notes:

1. Rack mount options available, click on the link below for full details.

2. All weights are approximate.

Rack mount options

→ view options