HCP10K0 series

XP Power

10kW Bench mount

AC-HVDC power supplies

The HCP10K0 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 0-12.5kV output models
- 3 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**

HCP10K0 series

Models & ratings

Model number	Polarity	Output voltage	Output current	Input voltage	Frequency	Connector	HV-cable
HCP3.5P3K0S	Positive	0 to +3.5kV	0 to 3A	400VAC, ±10%, 3 phase	47 to 63Hz	SHV-10	RG 58
HCP3.5N3K0S	Negative	0 to -3.5kV					
HCP3.5R3K0S	Reversible	0 to 3.5kV					
HCP6.5P1K5S	Positive	0 to +6.5kV	0 to 1.5A	400VAC, ±10%, 3 phase	47 to 63Hz		
HCP6.5N1K5S	Negative	0 to -6.5kV					
HCP6.5R1K5S	Reversible	0 to 6.5kV					
HCP012P800S	Positive	0 to +12.5kV	0 to 800mA	400VAC, ±10%, 3 phase	47 to 63Hz	HS 21	130 660
HCP012N800S	Negative	0 to -12.5kV					
HCP012R800S	Reversible	0 to 12.5kV					

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

⟶ view options

Analog programming & interfaces

⟶ view options

Digital programming & interfaces

⟶ 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 fuse	C9 25A 3-pol				
Input cable	3 phase mains (5 core cable): 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	<±1 x 10^{-3} of rated value with potentiometer on front panel <±1 x 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:<±0.2% of the nominal value Current: within the range of >5mA up to <200A: ±0.2% of the nominal value Outside the above mentioned range: <±0.5% of the nominal value Additional digital display error <±2 digits
Residual ripple	<1 x 10^{-4}pp +50mVpp (peak to peak), typ. 5 x 10^{-5}pp of rated value (measuring band width 30Hz to 10MHz) <3 x 10^{-5}, typ. <1.5 x 10^{-5} of rated value RMS
Control deviation	±10% mains voltage variation: <±1 x 10^{-5} of the rated value Open circuit / full load: 2 x 10^{-4} of the rated value Over 8 hours: <±1 x 10^{-4} of the rated value Temperature deviations <±1.5 x 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			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

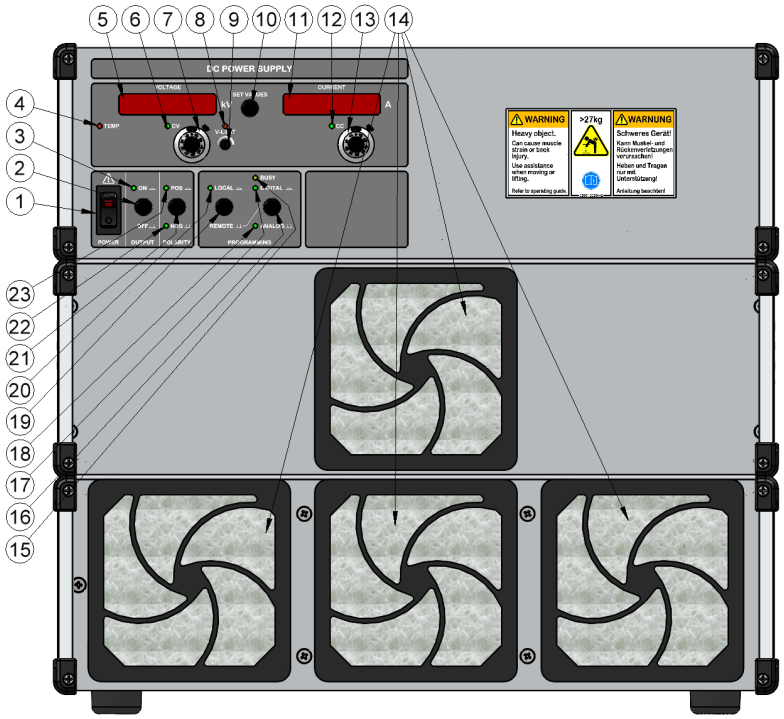
Phenomenon	Standard	Notes & conditions
Immunity	EN61000-6-2	Standard for industrial environments
Emissions	EN61000-6-4	Standard for industrial environments

Safety approvals

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

Mechanical details

Front view with controls



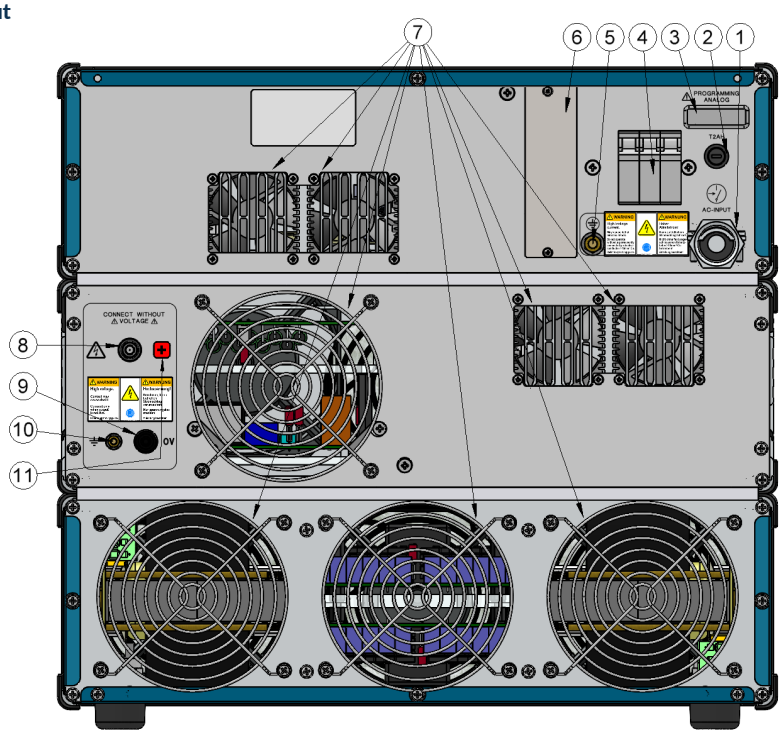
Example: HCP with dimensions: width 19”/443mm; height 9U/399mm

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-LIMT 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 three phase AC input



Example: HCP with polarity reversal and dimension: width 19”/443mm; height 9U/399mm

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 with permanently installed cable for 3-phase mains connections.	7	Air outlet for the power output stage.
2	Fuse holder for internal control fuse.	8	HV output (dedicated for screened HV- cable with grounded shield, which can be used for current return).
3	(Optional) 15-pin Sub-D connector for analog programming.	9	0V load connection, internally connected to the 0V of the electronics. This 0V connection is permanently connected to the protective conductor (PE).
4	Automatic main circuit breaker, fuse holder.	10	Earth bolt: This connection must be connected to the ground of the load!
5	Earth bolts, only for units with three-phase AC power connection. The DC power supply must be professionally earthed using 10 mm2 cable to the earth bolt provided.	11	Polarity indication: RED: POSITIVE, BLUE: NEGATIVE RED/BLUE: REVERSE POLARITY SWITCH
6	Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...). (Optional)		

HCP10K0 series

Mechanical details

Model number	Mounting	Width		Height		Depth	Weight[2]
HCP3.5P3K0S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP3.5N3K0S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP3.5R3K0S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP6.5P1K5S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP6.5N1K5S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP6.5R1K5S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP012P800S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP012N800S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg
HCP012R800S	Bench mount[1]	19”	443mm	9U	399mm	650mm	65kg

Notes:

1. Rack mount options available, click on the link below for full details.
2. All weights are approximate.

Rack mount options

→ view options