

**2.8kW** Bench mount

AC-HVDC power supplies

The HCP2K8 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 0-65kV 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](http://xppower.com)



## Models & ratings

| Model number | Polarity   | Output voltage | Output current | Input voltage            | Frequency  | Connector | HV-cable |
|--------------|------------|----------------|----------------|--------------------------|------------|-----------|----------|
| HCP3.5P800S  | Positive   | 0 to +3.5kV    | 0 to 800mA     | 400VAC, ±10%,<br>3 phase | 47 to 63Hz | SHV-10    | RG 58    |
| HCP3.5N800S  | Negative   | 0 to -3.5kV    |                |                          |            |           |          |
| HCP3.5R800S  | Reversible | 0 to 3.5kV     |                |                          |            |           |          |
| HCP6.5P400S  | Positive   | 0 to +6.5kV    | 0 to 400mA     | 400VAC, ±10%,<br>3 phase | 47 to 63Hz |           |          |
| HCP6.5N400S  | Negative   | 0 to -6.5kV    |                |                          |            |           |          |
| HCP6.5R400S  | Reversible | 0 to 6.5kV     |                |                          |            |           |          |
| HCP012P200S  | Positive   | 0 to +12.5kV   | 0 to 200mA     | 400VAC, ±10%,<br>3 phase | 47 to 63Hz | HS 21     | 130 660  |
| HCP012N200S  | Negative   | 0 to -12.5kV   |                |                          |            |           |          |
| HCP012R200S  | Reversible | 0 to 12.5kV    |                |                          |            |           |          |
| HCP020P120S  | Positive   | 0 to +20kV     | 0 to 120mA     | 400VAC, ±10%,<br>3 phase | 47 to 63Hz |           |          |
| HCP020N120S  | Negative   | 0 to -20kV     |                |                          |            |           |          |
| HCP020R120S  | Reversible | 0 to 20kV      |                |                          |            |           |          |
| HCP035P080S  | Positive   | 0 to +35kV     | 0 to 80mA      | 400VAC, ±10%,<br>3 phase | 47 to 63Hz | F 3430    | RG 11    |
| HCP035N080S  | Negative   | 0 to -35kV     |                |                          |            |           |          |
| HCP035R080S  | Reversible | 0 to 35kV      |                |                          |            |           |          |
| HCP065P040S  | Positive   | 0 to +65kV     | 0 to 40mA      | 400VAC, ±10%,<br>3 phase | 47 to 63Hz | KS 160    | C 2124   |
| HCP065N040S  | Negative   | 0 to -65kV     |                |                          |            |           |          |
| HCP065R040S  | Reversible | 0 to 65kV      |                |                          |            |           |          |

### 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      |         | %     |                    |
| Oversvoltage Category |  | II      |         |       |                    |
| Protection Class      |  | I       |         |       |                    |
| Input fuse            | C9 10A 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       | <math>\pm 1 \times 10^{-3}</math> of rated value with potentiometer on front panel<br><math>\pm 1 \times 10^{-5}</math> of rated value with option fine potentiometer<br>with option interface 16-bit resolution including sign bit (max. 22bit)  |
| Discharge time constant    | With output free of load, max. 10s  |
| Accuracy                   | Voltage: <math>\pm 0.2\%</math> of the nominal value<br>Current: within the range of >5mA up to <200A: <math>\pm 0.2\%</math> of the nominal value<br>Outside the above mentioned range: <math>\pm 0.5\%</math> of the nominal value<br>Additional digital display error <math>\pm 2</math> digits  |
| Residual ripple            | <math>< 1 \times 10^{-4}</math>pp +50mVpp (peak to peak), typ. <math>5 \times 10^{-5}</math>pp of rated value (measuring band width 30Hz to 10MHz)<br><math>< 3 \times 10^{-5}</math>, typ. <math>< 1.5 \times 10^{-5}</math> of rated value RMS  |
| Control deviation          | <math>\pm 10\%</math> mains voltage variation: <math>\pm 1 \times 10^{-5}</math> of the rated value<br>Open circuit / full load: <math>2 \times 10^{-4}</math> of the rated value<br>Over 8 hours: <math>\pm 1 \times 10^{-4}</math> of the rated value<br>Temperature deviations <math>\pm 1.5 \times 10^{-4}</math>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  |                                  |         | +80     | %     | Up to +31°C, decreasing linearly down to 50% RH at 40°C |
| Humidity - storage    |                                  |         | +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

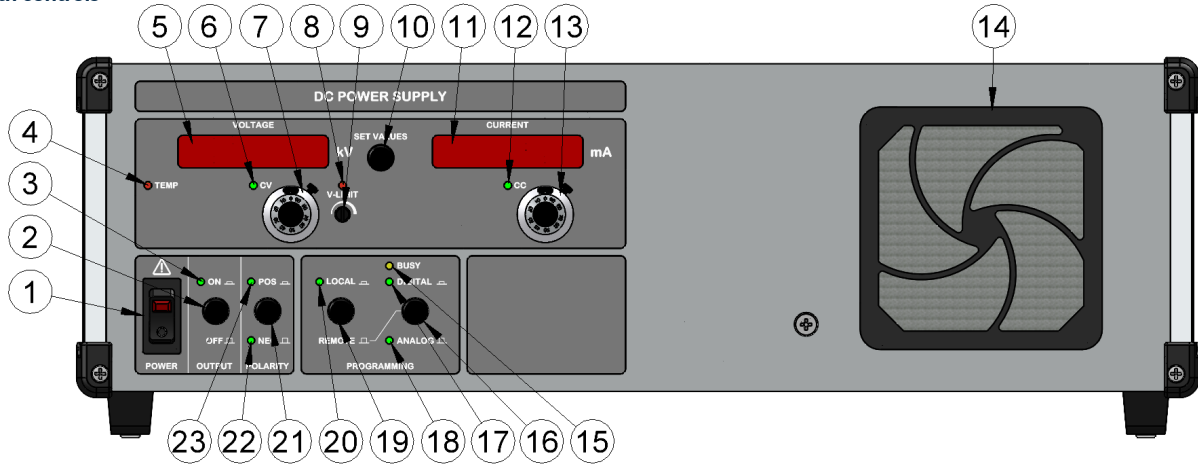
| Phenomenon | Standard    | Notes & conditions                   |
|------------|-------------|--------------------------------------|
| Immunity   | EN61000-6-2 | Standard for industrial environments |
| Emissions  | EN61000-6-4 | Standard for industrial environments |

## Safety approvals

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

## Mechanical details

### Front view with controls



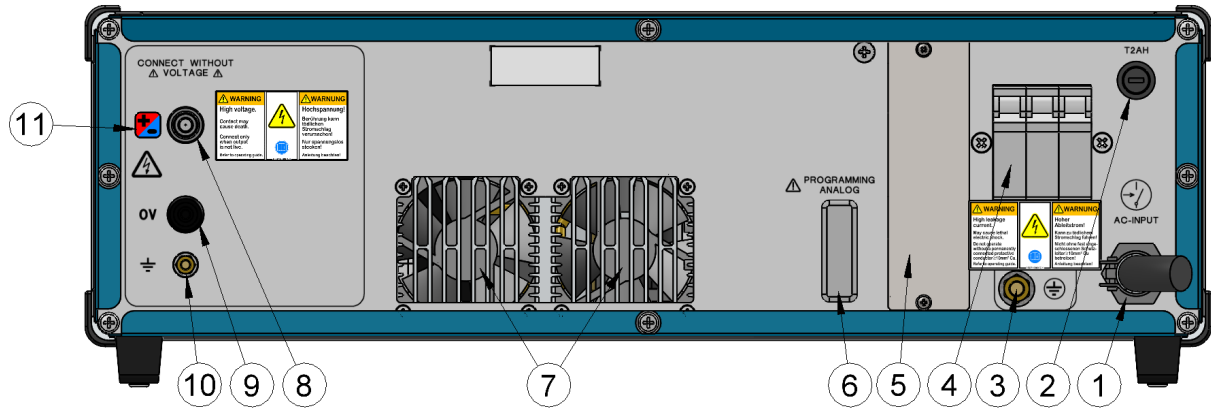
Example: HCP with dimensions: width 19"/443mm; height 3U/133mm

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 three phase AC input



Example: HCP with polarity reversal 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 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      | Earth bolts, only for units with three-phase AC power connection. The DC power supply must be professionally earthed using 10 mm <sup>2</sup> cable to the earth bolt provided. | 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      | Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...). (Optional)   | 11     | Polarity indication:<br>RED: POSITIVE, BLUE: NEGATIVE<br>RED/BLUE: OPTIONAL POLARITY REVERSAL SWITCH   |
| 6      | 15-pin D-Sub connector for analog programming. (Optional)   |        |  |

## Mechanical details

| Model number | Mounting                   | Width |       | Height |       | Depth                | Weight <sup>(2)</sup> |
|--------------|----------------------------|-------|-------|--------|-------|----------------------|-----------------------|
| HCP3.5P800S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 550mm <sup>(3)</sup> | 25kg                  |
| HCP3.5N800S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 550mm <sup>(3)</sup> | 25kg                  |
| HCP3.5R800S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 650mm                | 27kg                  |
| HCP6.5P400S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 650mm                | 27kg                  |
| HCP6.5N400S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 650mm                | 27kg                  |
| HCP6.5R400S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 3U     | 133mm | 650mm                | 27kg                  |
| HCP012P200S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 40kg                  |
| HCP012N200S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 40kg                  |
| HCP012R200S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 40kg                  |
| HCP020P120S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 48kg                  |
| HCP020N120S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 48kg                  |
| HCP020R120S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 48kg                  |
| HCP035P080S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 60kg                  |
| HCP035N080S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 60kg                  |
| HCP035R080S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 6U     | 266mm | 650mm                | 60kg                  |
| HCP065P040S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 8U     | 355mm | 650mm                | 80kg                  |
| HCP065N040S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 8U     | 355mm | 650mm                | 80kg                  |
| HCP065R040S  | Bench mount <sup>(1)</sup> | 19"   | 443mm | 10U    | 433mm | 650mm                | 90kg                  |

### Notes:

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

### Rack mount options

[→ view options](#)