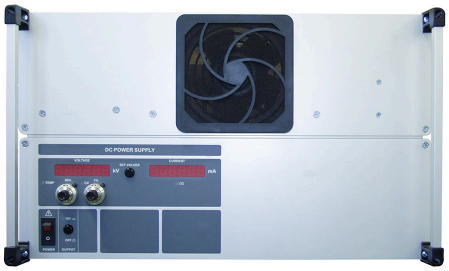
HCB20 series

XP Power

20W Bench mount

AC-HVDC power supplies



The HCB20 series are highly stable and low ripple bipolar switch-mode power supplies.The power supply units are suitable for capacitive and resistive loads. They enable 4-quadrant operation also for active loads and unlimited power consumption. The output can be operated in continuous zero crossing mode. The high switching frequency ensures an output voltage with low residual ripple, high stability, good control dynamics, and a low amount of stored energy in the output stage.

Features

- 0 to ±2kV - 0 to ±20kV bipolar output
- 4 quadrant operation with active load
- Constant voltage control and current limitation with automatic transfer and control mode dispay with LED's
- Single phase AC input
- Continuous operation at full rated power
- Digital and/or analog interface option
- Manual voltage control via 10 turn potentiometer
- Digital display for current and voltage
- Set-point display via a button
- Set-point adjustment possible with disabled output
- Push-button switch for output voltage
- 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 full our 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**

HCB20 series

Models & ratings

Model number	Polarity	Output voltage	Output current	Input voltage	Frequency	Connector	HV-cable
HCB2.0B010S	Bipolar	0 to ±2kV	±10mA	230VAC, ±10%	47 to 63Hz	SHV-10	RG-58
HCB020B001S	Bipolar	0 to ±20kV	±1mA	230VAC, ±10%	47 to 63Hz	F 3430	RG-11

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)
- Additional potentiometer for adjustment of current limitation

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 connector	IEC 60320 C14 receptacle				
Input cable	Single phase mains: with CEE-7/7				

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 by front panel mounted potentiometer.
Output polarity	Bipolar, continuous zero crossing
Output isolation	"0V" terminal is connected to the PE (EARTH), Current return preferably takes place via the screen of the output cable
HV output connection	The sockets are intended for a shielded output cable with earthed shielding. Mating HV connector and 3m cable are supplied.
Voltage control	<1ms with load changes from 10% to 90% or 90% to 10%, respectively
Voltage setting range	Using the VOLTAGE potentiometer, approx. -100% to 100% of the rated value
Current setting range	The output current is limited and fixed to the maximum value
Setting time at rated load	Typical 500ms, depending on type, for changes in the output voltage from -100% to 100%
Setting 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, 1s to 10s, depending on type
Accuracy	Voltage: <±0.2% of rated value Current: <±0.2% of rated value for current ranging between >5mA to <200A Current: <±0.5% of rated value for current ranges <5mA or >200A Additional digital display error <±2 digits
Residual ripple	$<3 \times 10^{-4}$ of the rated value + 50mVpp, typ. 2×10^{-4} pp of the rated value (measuring bandwidth 30Hz to 10MHz), $<1 \times 10^{-4}$ of the rated value + 20mV, typical 6×10^{-5} of the rated value RMS
Control deviation	±10% mains voltage variation: $<\pm 2 \times 10^{-5}$ of the rated value Open circuit / full load: 2×10^{-4} of the rated value Over 8 hours: $<\pm 2 \times 10^{-4}$ of the rated value Temperature deviations $<\pm 2 \times 10^{-4}$/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			+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 potentiometer, power switch, HV ON/OFF switch, digital display for current and voltage, current limit potentiometer (optional). 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 bipolar. The power supplies can be operated in the LOCAL, ANALOG (optional) and DIGITAL (optional) operating modes.

EMC: immunity & emissions

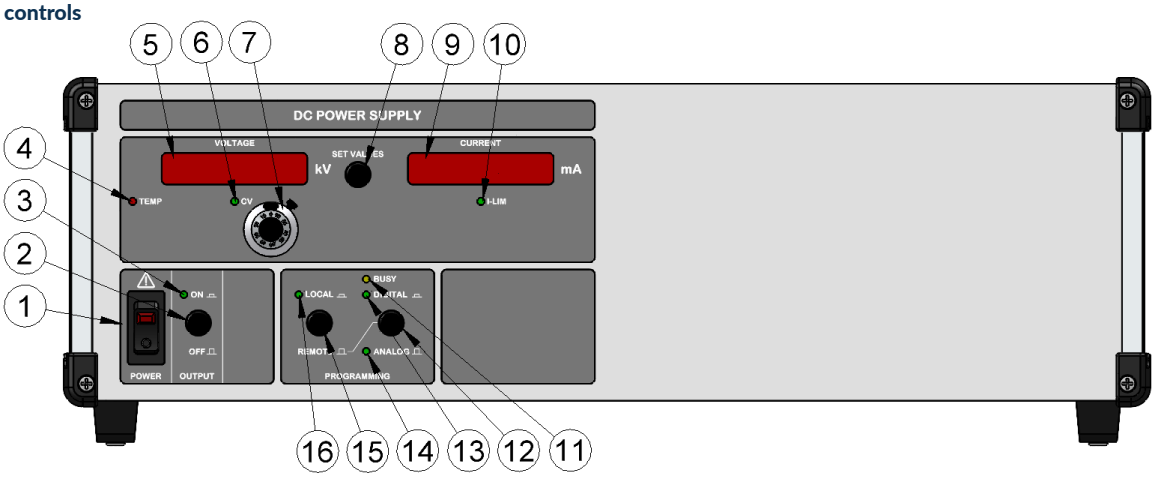
Phenomenon	Standard	Notes & conditions
Immunity	EN61000-6-1	Standard for residential, commercial and light-industrial enviroments
Emissions	EN61000-6-3	Standard for equipment in residential enviroments

Safety standard

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

Mechanical details

Front view with controls



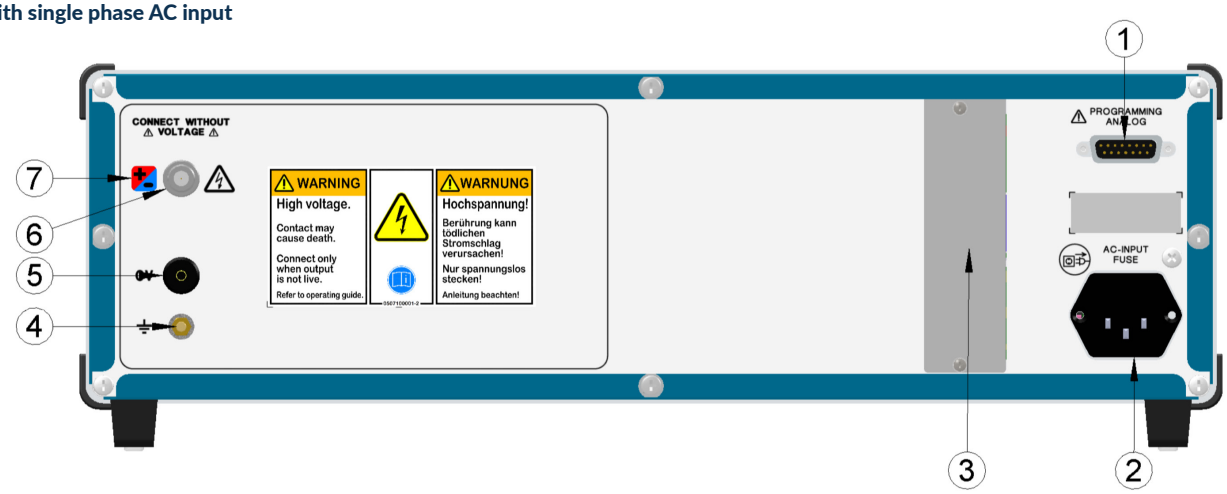
Example: HCB with dimensions: width 19”/443mm; height 3U/133mm

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.	9	CURRENT display: Indicating actual value. Displays set point when flashing
2	OUTPUT switch (DC). There is no mains disconnection!	10	I-LIM LED Illuminated green indicating active current set-point limit
3	ON LED: DC output ON. Illuminated green when the controller and power stage are ON.	11	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.	12	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.	13	DIGITAL LED: Illuminated green indicating digital programming active. (Optional)
6	CV LED: Illuminated green indicating constant voltage mode.	14	ANALOG LED: Illuminated green indicating analog programming active. (Optional)
7	Voltage adjustment: Ten-turn potentiometer with lockable precision dial.	15	LOCAL/REMOTE operation mode switch: Switches between LOCAL mode and REMOTE mode. (Optional)
8	SET VALUES switch: Switches displays between actual value and set value	16	LOCAL LED: Illuminated green indicating LOCAL control mode active. (Optional)

Mechanical details

Rear view with single phase AC input



Example: HCB 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	15-pin Sub-D 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).
2	AC input with mains fuses, IEC 60320-1 connector (as shown) with integrated fuse.	6	HV output (dedicated for screened HV- cable with grounded screen, which can be used for current return).
3	Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...). (Optional)	7	Polarity indication.
4	Earth bolt: This connection must be connected to the ground of the load.		

HCB20 series

Mechanical details

Model number	Mounting	Width		Height		Depth	Weight[2]
HCB2.0B010S	Bench mount[1]	19”	443mm	3U	133mm	350mm	9kg
HCB020B001S	Bench mount[1]	19”	443mm	6U	266mm	450mm	25kg

Notes:

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

Rack mount options

→ view options