DATASHEET
HIGH-VOLTAGE POWER SUPPLIES – HCB SERIES

TABLETOP MODELS UP TO 200W
RACK-MOUNTED MODELS UP TO 200W – ON REQUEST

PRODUCT PROPERTIES AND DATA

FUNCTION:

The HCB series power supplies (**H**igh Voltage-**C**hopper-**B**ipolar Power Supply) are highly stable bipolar switch-mode power supplies with low ripple.
Bipolar high-voltage power supplies of the HCB series internally consist of 2 primary switch-mode power supplies with pulse width modulation. The two switching power supplies are connected to each other at the output and are operated inversely. This allows the output to be continuously controlled via “0.”
The high switching frequency achieves a low residual ripple in the generated output voltage with high stability, good control dynamics, and at the same time only a low amount of stored energy.

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CHARACTERISTICS:

- 4-quadrant operation with active load and unlimited duration of reverse power feeding possible
- Permanently short-circuit and flash-over proof
- Can be operated indefinitely with rated current in case of a short-circuit
- Can be operated indefinitely with rated power
- Constant voltage control and current limitation with automatic transfer and control mode display with LEDs
- 4½-digit digital display for current and voltage in all power classes
- Voltage is set using a ten-turn potentiometer with a lockable precision knob
- Set-point display via a button
- Set-point adjustment possible with disabled output
- Push-button switch for output voltage (OUTPUT)
- Any load type; in principle, any passive two-terminal network is possible

We will be pleased to advise you – contact us at: sales@fug-elektronik.de oder +49 8039 400 77 0.

POSSIBLE OPTIONS:

- Coarse/fine-potentiometers (99% / 1%) for more accurate adjustment of voltage
- Additional potentiometer for adjustment of current limitation
- Analog programming/interface/interface
- Analog programming/interface/interface, floating
- Computer interfaces -IEEE 488, RS 232, RS 422, Profi-bus DP, USB, LAN (more on request)
- Signal für Ausgangsspannung < 50V
- Higher stability
- Lower stored energy
- Power regulation

More options and special solutions on request. Some options may involve changes to the description of the unit - especially concerning the mechanical design.

HIGH-VOLTAGE POWER SUPPLY OPERATING MODES:

The power supplies can be operated in the LOCAL, ANALOG (optional) and DIGITAL (optional) operating modes.

TECHNICAL SPECIFICATIONS

All data given here apply for voltage and current control during internal operation (LOCAL) and refer to the maximum output values.

DIMENSIONS:

The height and depth of the high-voltage power supply depends on its power rating and output voltage.

Detailed information can be found in the type table at the end of this document. A special version as 19" rack-mounted or with optional rack adapter is available.

ELEKTRICAL SPECIFICATION:

Mains connection:	230V ±10% 47 - 63Hz also refer to the details on the type plate. The N and PE (protective earth) connections are always required!
Protection class:	I
Overvoltage category:	II
Output:	Output values, voltage / current, see front panel or the type table
Short-circuit resistance:	The power supply is short-circuit and flash-over proof. The maximum current can be drawn at any output voltage, even in the event of a short-circuit.
Output polarity:	Bipolar, continuous zero crossing
Output isolation:	The "0V" terminal is connected to the PE (EARTH). Current return preferably takes place via the screen of the output cable.
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 resolution:	< ±1 x 10^{-3} of rated value with potentiometer on front panel < ±1 x 10^{-5} of rated value with fine potentiometer 1 x 10^{-4} of rated value with option interface
Displays:	DVM for voltage and current, range ±20000 LEDs for status messages voltage control / current control.
Reproducibility:	±1 x 10^{-3} of rated value with potentiometer on front panel ±1 x 10^{-4} of rated value with option interface
Residual ripple:	<3 x 10^{-4} of the rated value + 50mVss, typ. 2 x 10^{-4} ss of the rated value (30Hz – 10MHz) <1 x 10^{-4} of the rated value + 20mV, typical 6 x 10^{-5} of the rated value RMS
Regulation time:	
Voltage control:	<1ms with load changes from 10% to 90% or 90% to 10%, respectively
Setting time at rated load:	<100ms…500ms, depending on type, for changes in the output voltage from -100% to 100%
Discharge time constant:	with output free of load approx. 1sec to 10sec, depending on type
Control deviation:	with ±10% network change: <±2 x 10^{-5} of the rated value, with open circuit / full load: 2 x 10^{-4} of the rated value, over 8 hours: <±2 x 10^{-4} of the rated value, with temperature deviations <±2 x 10^{-4}/K of the rated value

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AMBIENT CONDITIONS:

Operation:	
Operation location:	Only for use in dry indoor areas
Temperature:	0°C bis +40°C
Humidity:	Max. relative humidity 80% up to 31ºC, decreasing linearly down to 50% relative humidity at 40ºC
Altitude:	Up to 2000m above sea level
Pollution degree:	1
Protection type:	IP20
Cooling:	The heat generated in the power supply unit is dissipated by convection or, in the case of high-power units, by forced ventilation.
Transport / Storage:	
Temperature:	-20°C bis +50°C
Humidity:	No precipitation and max. relative humidity of 80%
Storage rooms:	Dust-free and dry

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DC POWER SUPPLY COMPONENTS

FRONT VIEW WITH CONTROLS:

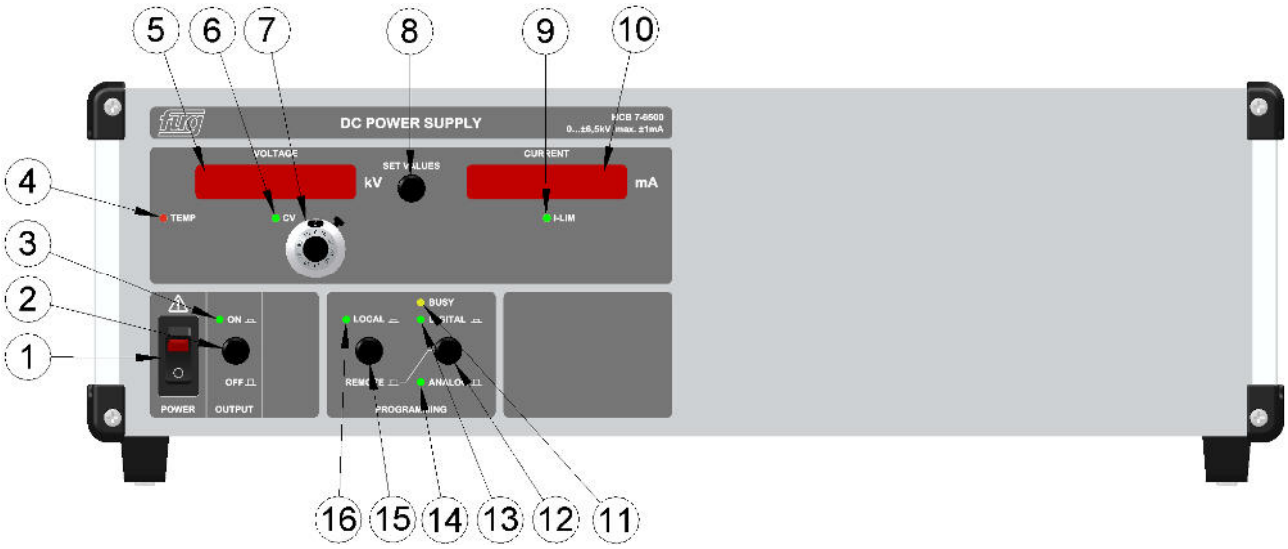

Figure: Front Panel – HCB 7 - 6500. Different dimensions apply for DC power supplies with higher performance

1	AC power switch with indicator light Disconnects the power supply from the mains, two-pole switching	9	I-LIM LED for active current set-point limit
2	DC output ON (OUTPUT) There is no mains disconnection!	10	Current display actual value Current display dark when SET VALUES switch is pushed
3	DC output ON LED Lights up green when the controller and therefore the power stage is operating (OUTPUT ON)	11	(Optional) LED BUSY displays data traffic on the digital interface
4	Over-temperature LED: Internal device temperature too high, fan failed or contaminated. (Use is type-dependent)	12	(Optional) Switching the operation mode between REMOTE/ANALOG and REMOTE/DIGITAL
5	Voltage display flashing: Set point; not flashing: Actual value	13	(Optional) LED indicating digital programming active
6	LED for constant voltage control mode (Constant Voltage)	14	(Optional) LED indicating Analog programming/interface/interface active
7	Lockable potentiometer for voltage adjustment	15	(Optional) Switching the operation mode between LOCAL and REMOTE
8	SET VALUES Switch displays between Set-point mode and Actual output mode, displays flash when in set point mode.	16	(Optional) LED indicating LOCAL control mode active

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REAR VIEW WITH SINGLE-PHASE AC INPUT:

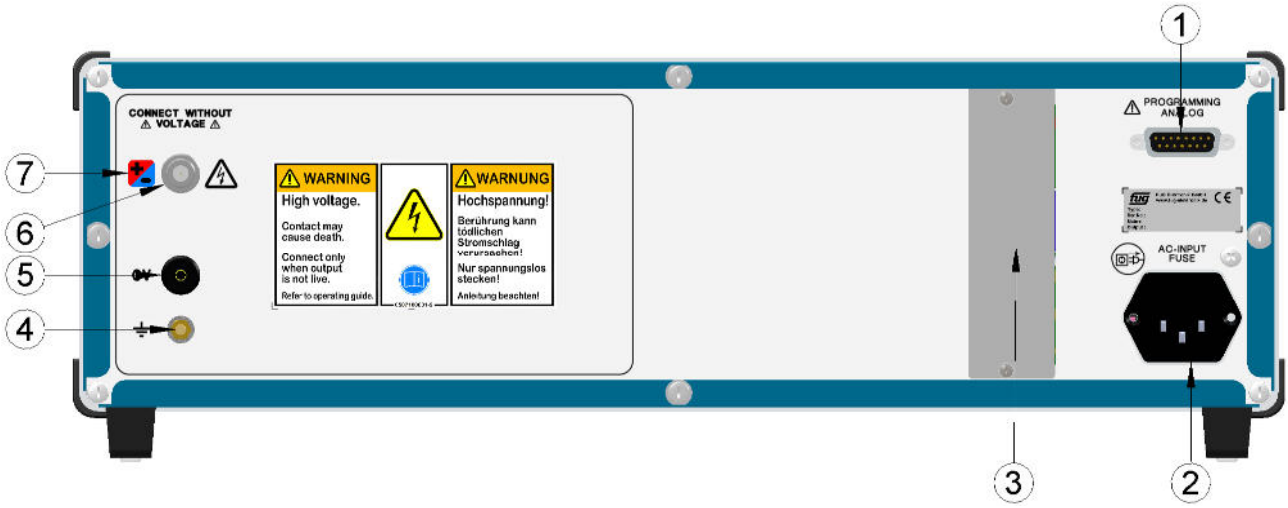

Figure: Rear panel – HCB 7 - 6500. For DC power supplies with higher power or other voltages, other dimensions may apply. The elements' layout may vary from that shown here.

1	(Optional) 15-pin Sub-D connector for Analog programming/interface/interface
2	AC input with mains fuses IEC connector (as shown) with integrated fuse.
3	(Optional) Slot for digital interface (e.g.: IEEE-488, RS232, USB, LAN, ...)
4	Earth bolt: This connection must be connected to the ground of the load! This earth bolt is permanently connected to the protective conductor (PE).
5	0V load connection, internally connected to the 0V of the electronics. This 0V connection is permanently connected to the protective conductor (PE).
6	HV output (dedicated for screened HV- cable with grounded screen, which can be used for current return)
7	Polarity indication

TYPE TABLE

Type	Voltage	Current	Width	Height	Depth	Weigth
HCB 1,4 - 1250	0 - ±1250 V	0 - ±1 mA	19" / 443 mm	3 HE / 133 mm	350 mm	6 kg
HCB 14 - 1250	0 - ±1250 V	0 - ±10 mA	19" / 443 mm	3 HE / 133 mm	350 mm	7 kg
HCB 2 - 2000	0 - ±2000 V	0 - ±1 mA	19" / 443 mm	3 HE / 133 mm	350 mm	6 kg
HCB 20 - 2000	0 - ±2000 V	0 - ±10 mA	19" / 443 mm	3 HE / 133 mm	350 mm	9 kg
HCB 3,5 - 3500	0 - ±3500 V	0 - ±1 mA	19" / 443 mm	3 HE / 133 mm	350 mm	7 kg
HCB 35 - 3500	0 - ±3500 V	0 - ±10 mA	19" / 443 mm	3 HE / 133 mm	450 mm	10 kg
HCB 7 - 6500	0 - ±6500 V	0 - ±1 mA	19" / 443 mm	3 HE / 133 mm	350 mm	10 kg
HCB 70 - 6500	0 - ±6500 V	0 - ±10 mA	19" / 443 mm	3 HE / 133 mm	550 mm	15 kg
HCB 14 - 12500	0 - ±12500 V	0 - ±1 mA	19" / 443 mm	3 HE / 133 mm	350 mm	30 kg
HCB 140 - 12500	0 - ±12500 V	0 - ±10 mA	19" / 443 mm	6 HE / 266 mm	550 mm	42 kg
HCB 20 - 20000	0 - ±20000 V	0 - ±1 mA	19" / 443 mm	6 HE / 266 mm	550 mm	35 kg
HCB 200 - 20000	0 - ±20000 V	0 - ±10 mA	19" / 443 mm	6 HE / 266 mm	550 mm	45 kg

All specifications are subject to change without further notice.

Please feel free to contact our sales team for any further questions:

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