



DP-HV Series User's Manual

By DSC-Electronics Germany • Georgstraße 36 • 53111 Bonn

1. Power

Our devices are pre-configured to the power grid chosen with order (if not specified otherwise, our devices are manufactured for the EU power grid 230V 50Hz / 400V 50Hz). Subsequent adjustment after delivery is not possible. Connecting the device to an unsuitable power source will void any warranty.

1 Phase / EU Power Grid	
Voltage (Recommended)	230V ± 10% AC
Voltage (Max.)	250V AC
Frequency	50Hz - 60Hz
Circuit breaker minimum requirements	The maximum current of the device shall be determined as follows: $I = (\text{maximum power of the device} / 230) + 2$
1 Phase / American Power Grid	
Voltage (Recommended)	115V ± 10% AC
Voltage (Max.)	130V AC
Frequency	50Hz - 60Hz
Circuit breaker minimum requirements	The maximum current of the device shall be determined as follows: $I = (\text{maximum power of the device} / 115) + 4$

3 Phase / EU Power Grid (TN-S Network)	
Voltage (Recommended)	380V - 410V
Voltage (Max.)	430V
Frequency	50Hz
Circuit breaker minimum requirements	The maximum phase current of the device shall be determined as follows: $I = ((\text{maximum power of the device} / 400) / 1,73) + 2$

2. General

Please read through and understand this Operation Manual before operating the product. After reading always keep the manual nearby so that you may refer to it as needed. When moving the product to another location, be sure to bring the manual as well.

Calibration

Before shipment, the instrument has been calibrated carefully in our factory. The calibration procedures and standards are compliant to the national regulations and standards for electronic calibration. If you have requested a certificate with your order, this is enclosed with your device. With ordered off-site calibration (DaKKS) the calibration was not performed in-house, please refer to the laboratory calibration protocol for details.

Warranty

We guarantee that the instrument has undergone a strict quality test before shipment and has passed all prescribed functional tests. We provide our customers with a warranty period of three years from receipt of the device. During the warranty period, all repairs, as well as spare parts are always free of charge. The warranty is void in the case of defects which have been caused by user's fault, or in case of unauthorized opening.

2.1 Safety Instructions

This chapter contains important safety instructions that you must follow when operating the instrument and when keeping it in storage. Read the following before any operation to ensure your safety and to keep the device in a proper condition.

Safety Symbols

The following safety symbols may appear in this manual or on the instrument:



WARNING

Identifies conditions or practices that could result in injury or loss of life.



CAUTION

Identifies conditions or practices that could result in damage to the instrument or to other properties.



DANGER

High Voltage



ATTENTION

Refer to the Manual



Protective Earth (PE)



Earth (Ground)

2.2 Safety Guidelines

Please follow the safety guidelines when using and putting the device into operation in order to prevent safety risks and to ensure the correct operation of the product.

- Before connecting the device to the local power supply, make sure that the device is switched off.
- Check if the product is compatible with the local power supply before connecting it.
- Solid and correct grounding (PE) of HV power supplies is critically important for a safe operation.
- Do not use the product in humid environments.
- Do not touch the output terminals of the product with unprotected hands while it is switched on.
- Do not use the device in extremely dusty rooms.
- Do not use the device outside the parameters specified in the data sheet.
- Ensure that your application does not cause the power supply to experience conditions exceeding the maximum specifications.

ATTENTION: Stray inductance and capacities can cause significant currents to flow in high voltage applications, which in turn cause significant potential differences even across solid conductive parts. For this reason it is exceptionally important to ensure proper grounding. The use of thick copper cables or bus bars is recommended to reduce potential differences and prevent failures.

2.3 Unpacking and Examination

Our products are delivered carefully packed in cardboard boxes or in wooden crates, depending on place of destination and the type of the device (dimensions, weight). We pay attention to the environmental compatibility of the upholstery and packaging materials used and ask you to dispose the filling material correctly if present.

Please unpack the device and check the packaging as well as the product for transport damage. Should you notice any damage to the packaging or the device, we ask you to log it with photos and inform us immediately.

ATTENTION: If the device has been delivered in a wooden box, please do not dispose it as it can be used for eventual return transport for service procedures. Also the packaging material of smaller devices can be stored in order to be used if necessary for a return transport.

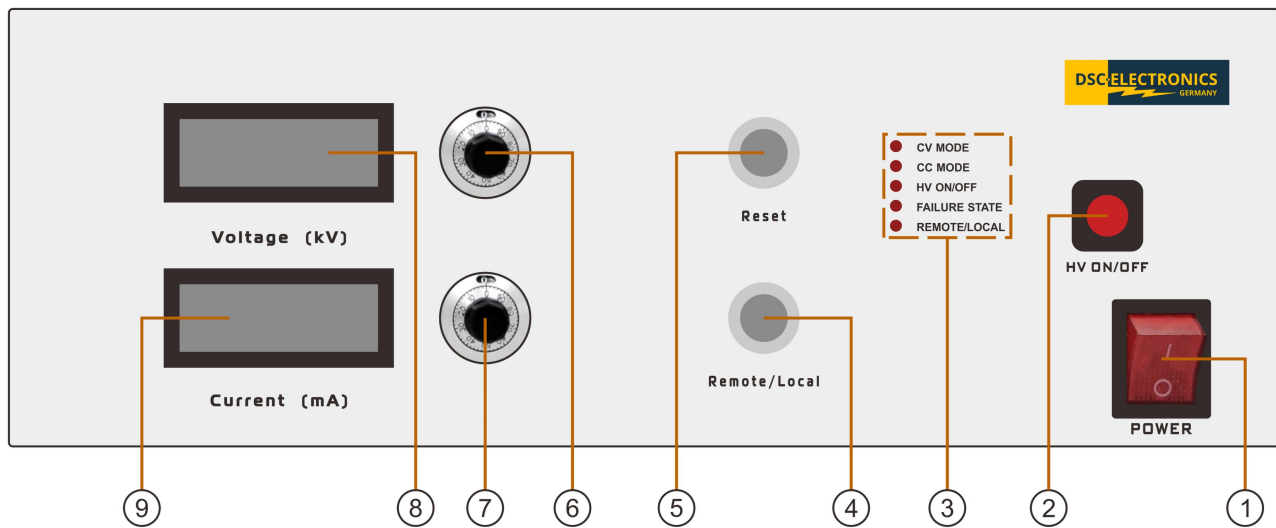
3. Product Description

The DSC-Electronics DP-HV Series are high voltage power supplies with a ground tied output available with voltages up to 300kV and positive or negative polarity. These devices feature a good stability and drift performance together with extensive security measures (over voltage, over current, over temperature, short circuit and arc protection) to ensure a safe operation.

Featuring analog I/O by default, these devices can be optionally equipped with a digital adapter to allow operation over Modbus-RTU.

4. Panel Controls and Indicators

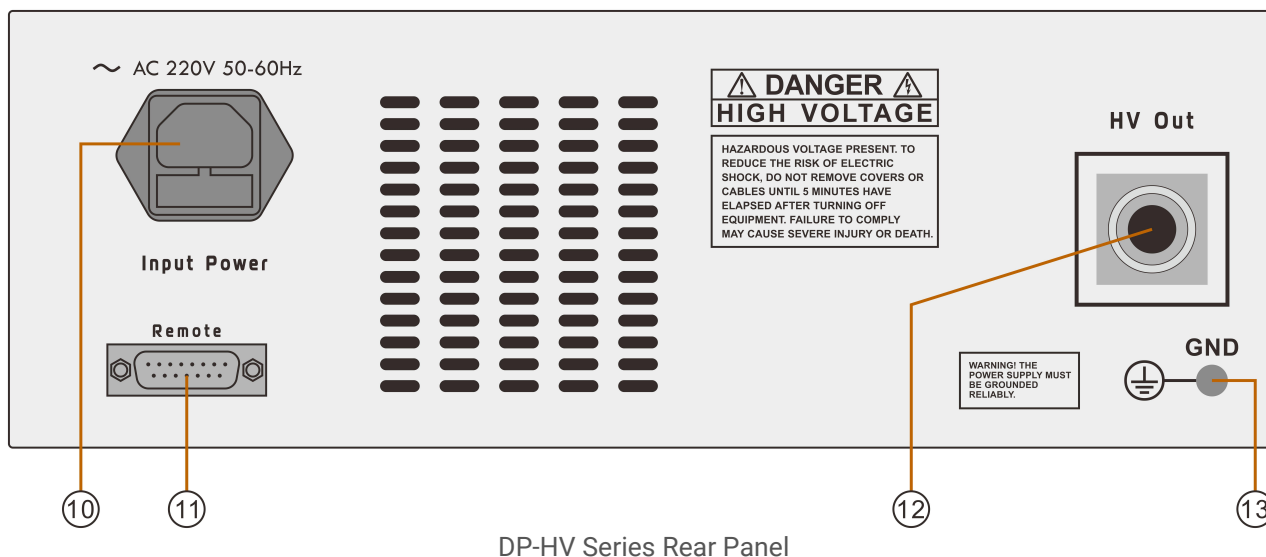
4.1 Front Panel Illustration



DP-HV Series Front panel

No	Name	Description
1	Power Switch	Turns ON/OFF the power supply.
2	HV On/Off Switch	Turns ON/OFF the output of the power supply.
3	Indicator Section	CV Mode: Power Supply operates in a constant voltage mode. CC Mode: Power Supply operates in the constant current mode. HV ON/OFF: The power supply output is enabled/disabled. Failure State: Signals a failure state (a disabled output is considered a failure state). Remote/Local: Signals the current control mode.
4	Remote/Local Switch	Switches the power supply between remote and local operation.
5	Reset Button	Resets the failure state manually. NOTE: Inactive on standard devices as the failure state resets automatically.
6	Voltage Knob	Output voltage adjustment.
7	Current Knob	Output current adjustment.
8	Voltage Display	Indicates the output voltage.
9	Current Display	Indicates the output current.

4.2 Rear Panel Illustration



No	Name	Description
10	Power Socket	Input power socket with fuse.
11	Remote Port DB15	Analog control I/O, for details see the remote control section below.
12	HV Output Terminal	Positive or negative HV output terminal (depending on the selected configuration).
13	GND Point	Ground point (PE).

5. Operation

Before proceeding with the operation of the HV power supply please make sure that you read and understand the guidelines and warnings stated in the section "2" and especially the safety guidelines "2.2".

5.1 Basics

Before putting the device into operation, you need to learn the functionality of the front panel and meanings of the indicators. After turning on the **POWER** switch, the power supply enters the standby mode.

The power supply can be switched between internal and external control by pressing the button "Remote/Local" on the front panel. In remote control mode, the "REMOTE/LOCAL" indicator lights on, and only the "Remote/Local" button is active while all other buttons and knobs are locked.

While in "LOCAL" operation mode, the power supply output status is being controlled only by pressing the "HV On/Off" Button while in "REMOTE" mode the button is inactive and the output status is being controlled remotely.

Before turning on the power supply always verify if the "HV ON/OFF" button is in the "OFF" position, and the load connected to the power supply is suitable for the voltage selected.

5.2 Load connection

Plug one end of your HV cable into the HV terminal of the power supply and make sure that the cable is locked tightly, screw the plug into the terminal until both the cable and the terminal are firmly connected.

NOTE: The HV terminal only provides sufficient protection and isolation when either mated with a suitable HV cable plug, or firmly closed with the plastic cover. Do not under any circumstances touch the HV connector while the power supply is ON and the connector is uncovered and not connected to a cable.

5.3 Power ON

Turn on the power supply by bringing the "POWER" switch into the "I" position, the cooling fan(s) start to run and the displays show the set values (eventually 0000) while the indicator section "3" shows the current state of the power supply systems.

By default, the "CV MODE" and "FAILURE STATE" LED's turn on, while all other LED's stay off - this indicates that the power supply systems are in stand by. The "FAILURE STATE" LED lights on if the actual output values are not equal to the expected or set output values, which is essentially the case if the output is turned off which is why it is normal and not a sign of malfunction if the "FAILURE STATE" LED is turned on during standby.

5.4 Adjustments

The power supply can work in both constant voltage (CV) mode and constant current (CC) mode, while the switching is automated. Output voltage and output current is adjusted through their rotary knob respectively, number "6" and "7" located on the front panel. Turn the rotary knob clockwise to increase the output value or turn it anti-clockwise to decrease the output value.

On each rotary knob, there is a lock switch to lock the value in place. Slide the lock switch to the right and the adjustment knob will be locked to avoid accidental operation, slide the lock switch to the left to unlock the knob.

5.5 Output ON

Press the HV ON/OFF switch to start the high voltage output as soon as you have verified that you made correct voltage and current adjustments and the load connected is intended to be operated with these values.

The "FAILURE STATE" indicator turns off and the "HV ON/OFF" indicator lights on.

In case of an over current event, the device will automatically switch to the CC mode until the current drops back into the range adjusted. In this case you will notice the "FAILURE STATE" and "CC MODE" indicators flash briefly.

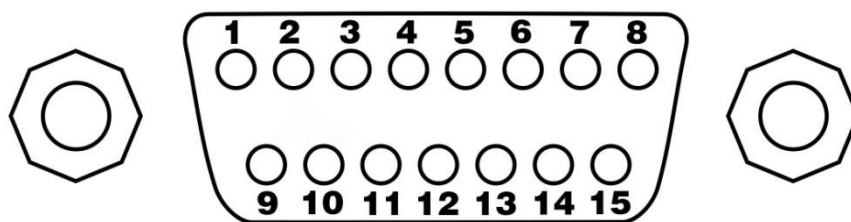
5.6 Output OFF

Press the HV ON/OFF switch turn off the high voltage output. The "FAILURE STATE" indicator turns on and the "HV ON/OFF" indicator turns off.

IMPORTANT: Please note that inductive loads can cause significant voltage transients during power off events, while capacitive loads will attempt to discharge into the power supply when the output is powered off. Both situations can lead to permanent damage to the power supply, thus make sure to add sufficient protection to keep voltage and current values within the maximum power supply ratings at all times.

6. Remote Operation

Power supplies of the DP-HV series are by default equipped with a PLC analog I/O to allow operation and reading of the output values and state remotely.



DB15 Pinout Definition

Pin No.	Description	Reference value	Remarks
1	Input for voltage control	0 to +10V in proportion to 0 to 100% rated output.	
2	GND		
3	Input for current control	0 to +10V in proportion to 0 to 100% rated output.	
4	GND		
5	Voltage feedback	0 to +10V in proportion to 0 to 100% rated output.	
6	GND		
7	Current feedback	0 to +10V in proportion to 0 to 100% rated output.	
8	Reset	High level $\leq 15V$	
9	Output control loop	Pin 9-10 closed = HV ON	
10	Output control loop	Pin 9-10 closed = HV ON	
11	Voltage mode status	Open collector, maximum voltage 35V, maximum current 10mA	Low level valid
12	Current mode status	Open collector, maximum voltage 35V, maximum current 10mA	Low level valid
13	Failure status	Open collector, maximum voltage 35V, maximum current 10mA	Low level valid
14	HV ON/OFF indicator	Open collector, maximum voltage 35V, maximum current 10mA	Low level valid
15	+15V	Open collector, maximum voltage 35V, maximum current 10mA	