



实验室电源供应器系列

Laboratory Power Supply Series

EA-HV 9000

Art. Nr.: 26100103 - 114 (标准版)

Art. Nr.: 26400103 - 114 (IEEE)

Art. Nr.: 26600103 - 114 (Ethernet-配以太网卡)

Art. Nr.: 2690x103 - 114 (特殊版)



技术规格 / Technical specifications

型号 Model	输出电压 Output voltage	输出电流 Output current	输出功率 Output power	产品编号** Article number**
EA-HV 9000-1K2-2000	1200V	1,67A	2000W	26100103
EA-HV 9000-2K-2000	2000V	1A	2000W	26100104
EA-HV 9000-4K-2000	4000V	500mA	2000W	26100114
EA-HV 9000-6K-2000	6000V	350mA	2000W	26100105
EA-HV 9000-12K-2000	12kV	170mA	2000W	26100106

EA-HV 9000系列的技术规格 / Technical specifications Series HV 9000

输入电源 / Mains input	90...264 V _{AC} / 50/60 Hz
输入电流损耗 / Input current consumption	最大10 A _{eff} (@230 V)
效率 / Efficiency	≥0.98
干扰抑制 / Interference suppression	EN 50081 第2部分, EN 50082-2
各端子 / Terminals	Sub-D模拟接口 / Analogue interface Sub-D
高压输出端 / High voltage output	带接地的高压插座 High voltage socket with grounding socket

电压控制 / VOLTAGE CONTROL

可调范围 / Adjustment range	0...100%
调整精度 / Regulation accuracy	
±10%输入电压时的误差 / Difference at input voltage	≤ 0.05%
无负载-满载时的误差 / No load - full load - difference	≤ 0.05%
50%负载电流跳跃时的击穿电压 / Voltage breakdown at 50% load current leap	约 / approx. 2%
负载改动为50%时的设定时间 / Setting time at 50% load change:	≤ 2 ms

动态内阻 / Dynamic internal resistance:

1...10Hz	≤ 0.2% of R _{Lnom} / ≤ R _{Lnom} 的0.2%*
10...100Hz	≤ 1% of R _{Lnom} / ≤ R _{Lnom} 的1%*
100...10.000Hz	≤ 10% of R _{Lnom} / ≤ R _{Lnom} 的10%*
运行8小时以上的稳定度 / Stability over 8 hrs	≤ 0.01%
温度稳定度 / Temperature stability	≤ 50 ppm/K
纹波 / Ripple	≤ 0.05% of U _{Nom} / ≤ U _{Nom} 的0.05%

电流控制 / CURRENT CONTROL

调整范围 / Adjustment range	0...100%
调整精度 / Regulation accuracy	
±10%输入电压时的误差 / Difference at input voltage ±10%	≤ 0.05%
短路/满载时的误差 / Difference short-circuit/full load	≤ 0.05%
运行8小时以上的稳定度 / Stability over 8 hrs	≤ 0.05%
温度稳定度 / Temperature stability	≤ 500 ppm/K
纹波 / Ripple	≤ 0.05% of I _{Nom} / ≤ I _{Nom} 的0.05%

显示 / DISPLAY

电压显示精确度 / Accuracy of voltage indication	±0.2% + 2 位数 / Digits
电流显示精确度 / Accuracy of current indication	±1% + 2 位数 / Digits

模拟接口 / ANALOGUE INTERFACE

输入U _{Set} 的精确度 / Accuracy of input U _{Set}	< 0.4%
输入I _{Set} 的精确度 / Accuracy of input I _{Set}	< 1.3%
输出U _{Mon} 的精确度 / Accuracy of output U _{Mon}	< 0.5%
输出I _{Mon} 的精确度 / Accuracy of output I _{Mon}	< 1%

可选IEEE接口 / Optional IEEE Interface

分辨率 / Resolution	12 位 / Bit
错误 / Error	±1 LSB

尺寸 (长 宽 高) / Dimensions (W H D)

重量 / Weight	13 kg
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* R_{Lnom} = U_{max} / I_{max}

** 针对标准型号 / of standard models

高压电源系列 EA-HV 9000

HV9000系列电源实际为调频谐振转换器。在500至2000W的功率范围内，其推至推式开关频率可高达200kHz。由于梯形电压过零时会被转换，转换阶段效率将近99%。该先进理念结合多个调整回路，从而可构建高达100kV的精确高压系统，并具有突出的调整性能。输入电源为90...264V/50-60Hz，带主动式功率因素校正。

功能

本机出厂时为桌面式结构，用随附套件可改装成19"机柜式。通过10圈电位器调节电压和电流，在待机模式下可预设数值，并显示于数字表上。操作模式通过LED灯指示出来。输出电压和电流也可通过0...10V外部电压对0...额定值（PLC控制）进行设置。两外部监控输出脚（U&I）对应0...额定值分别供应0...10V的输出电压。

接上IEEE.2接口，所有系统应用都可实现。编程端子上有一个联锁线圈。

HV9000系列产品有法阏和连续短路保护，反之可从0...100%调节电压和电流。当发现输出电压大量回落时，产品会短时关闭后再自动开启，电压从0V慢慢上升至预设值。故到达输出端的能量被减至最小。所以完全可以应用于电子管、等离子气体的放电加工和电容的充电。

High Voltage Power Supplies Series EA-HV 9000

The power supplies of the series **HV9000** are frequency modulated resonance converters. The push-to-push switching frequencies are up to 200kHz in the power range of 500 to 2000W. Because the trapezoid shaped voltage is switched when passing zero the efficiency of the switching stage is nearly 99%. This modern concept in connection with multi regulation loops allows the construction of precise high voltage systems up to 12kV with outstanding regulation performances. The mains input is 90...264V/50-60Hz with an active power factor correction.

Function

The units are delivered as desktop versions, but can be modified to 19" racks with the included kit. Voltage and current are adjusted with 10-turn potentiometers, the values can be preset in standby mode and are displayed on digital meters. The operation modes are indicated by LEDs. The output voltage and current can be externally set by means of an external voltage of 0...10V for 0...rated value (PLC control). The two external monitor outputs (U & I) each provide an output voltage of 0...10V for 0...rated value.

In connection with the IEEE.2 interface practically all systems applications are possible. An interlock loop is available on the programming terminal.

The units of the series **HV9000** are flashover- and continuous short-circuit-proof, whereas voltage and current are still adjustable from 0...100%. On a large fallback of the output voltage the unit is switched off for a short time and than automatically starting slowly again from 0V to the preset voltage. The energy reaching the output is therefore reduced to a minimum. So applications with tubes, plasma-gas de-charging processes and capacitor charging are possible.

仪表

本产品配有分别显示电压和电流的3½数字式、13mm发光LCD。这两仪表可自主切换显示设定值、实际值或过压保护值。

Instruments

The units are equipped with separate illuminated 3½ digit 13mm LCD volt- and amperemeters. In both cases it is possible to independently switch between the value set, the actual value or the OVP value.

输出电压的远程调节

可通过0...10V外部电压对 $U_0 \dots U_{\max}$ 输出电压从外部设定。外部编程端位于产品后板。

Remote adjustment of the output voltage

The output voltage can be externally set by means of an external voltage of 0...10V for $U_0 \dots U_{\max}$. The terminals for the external programming are on the rear of the unit.

输出电流的远程调节

可通过0...10V外部电压对 $I_0 \dots I_{\max}$ 输出电流从外部设定。外部编程端位于产品后板。

Remote adjustment of the output current

The output current can be externally set by means of an external voltage of 0...10V for $I_0 \dots I_{\max}$. The terminals for the external programming are on the rear of the unit.

IEEE总线 / 以太网

还可选择为本机配上一IEEE总线接口或以太网接口。连接端位于产品后面。关于IEEE总线或以太网接口选项的测量和控制特征，可参考用户说明书选项部分。

IEEE bus / Ethernet

As an option, the units can be equipped with an IEEE bus interface or an Ethernet interface. The connection terminals are located on the rear of the unit. Further details about measuring and control features of the IEEE or Ethernet option are available in the option's user instruction manual.

高压输出端

高压输出端位于产品后板。由于宽范围的输出电压，针对终端极性不同会有不同的输出配置。

High voltage output

The high voltage output is located on the rear of the unit. Because of the wide output voltage range there are different output configurations regarding the termination of polarisation. The output is equipped with a high voltage connector Y-series from LEMO. The polarity can be reversed internally (**upon request, only to install in the factory**).

此类产品的输出端配有一由LEMO公司制造的Y型高压连接器。可从内部反接其极性（按客户需求，可以且仅能于工厂内安装）。

By default, the "DC-" is internal connected to PE, so "DC+" is connected with the center wire of the HV connector. The screen is connected to PE. The center wire leads the high voltage, the screen may not be used as a part of the load wire.

默认状态下，"DC-"从内部连到PE，故"DC+"就连到HV连接器的中性线。中性线输出高电压，屏蔽线不可用作负载线的一部分。



屏蔽线不可用做负载连接。回流线必须接到PE端子上。GND一直连到PE。



The screen may not be used as load connection. The return line must be connected to the PE terminal. GND is always connected to PE.

高压端子的元件名称

（制造商为LEMO）

HV-插座（6 kV以下型号） ERA 1Y405

HV-插座（12 kV型号） ERA 3Y415

HV-插头（6 kV的型号） FFA 1Y405

HV-插头（12 kV的型号） FFA 3Y415

Part names of the HV connectors

(manufacturer LEMO):

HV socket (models up to 6 kV): ERA 1Y405

HV socket (model 12 kV): ERA 3Y415

HV plug (models up to 6 kV): FFA 1Y405

HV plug (model 12 kV): FFA 3Y415

高压导线的订购编号：106330

Ordering number HV lead: 106330

过压保护 (OVP)

本系列所有产品都有过压保护功能。用电位器从前板可在最大额定电压的1%到101%范围内设定任何数值。

激活**"OVP"**开关后预设OVP值显示于电压表上，且**"Preset"** LED灯亮。

若因某个原因输出电压高过预设电压（如：操作错误，元件不良，外部供有电压），换接式振荡器被锁定，不再供应电量到输出端，且 **"OVP"**灯亮。要想OVP恢复至正常值，必须激活**"Reset"**按钮。



OVP保护连接负载不会因过压而损坏。建议根据实际情况调整OVP值。

Overvoltage protection (OVP)

All units are equipped with an overvoltage protection as standard. Any value between 1% and 101% of the max. rated voltage can be set with the trimmer on the front panel. The preset OVP value is indicated on the voltmeter after activating the **"OVP"** switch and the **"Preset"** LED lights on. If the output voltage becomes, for any reason, higher than the preset voltage (e.g. operators fault, defective components, external voltage), the switching oscillator is blocked, and no further energy comes to the output. The LED **"OVP"** lights on. To reset the OVP to normal, the "Reset" button must be activated.



The OVP protects connected loads from possible damage due to overvoltage. It is recommended to always adjust the OVP value according to the situation.

待机操作 (Standby)

可用**"Output"**按钮关闭输出电压。开关上的LED指示直流输出状态，但是仅针对手动控制模式。**"Off"**LED灯亮=输出为零。**"On"**LED灯亮=输出被激活。



注意！LED灯在远程控制模式不指示直流输出状态！

Standby operation

The output voltage can be switched off with the push-button **"Output"**. The LEDs on the switch indicate the DC output condition, but only during manual control. The LED **"Off"** lights on = output zero. The LED **"On"** lights on = output active.



The LEDs do not indicate the DC output condition in remote control!

电压和电流的调节

待机模式下用10圈精密电位器可预设电压和电流值。分别激活**"Voltage"**和**"Current"**推动开关，对应的**"Preset"**LED灯亮，预设值则显示于仪表上。**"Actual"**灯指示实际值已显示于仪表上。

Voltage and current adjustment

The values of the voltage and current can be preset in standby mode by means of 10-turn precision potentiometers. The push switches **"Voltage"** respectively **"Current"** must be activated, the corresponding LED **"Preset"** lights on and the preset value is indicated on the meters. The LEDs **"Actual"** indicate that the actual values are displayed on the meters.

描述 / Description

安装

操作产品前，需检查产品外壳、控制件等是否有机机械损坏。

必须使用所供Sub-D插头来连接。

如发现有任何损坏，不可将产品连到市电。打开产品前断开电源插头。



应由受训工程人员执行本机的服务、维修或校正。

本机仅能在铭板规定电压下操作。如需更换保险丝，有一点极其重要，即：仅能用与原厂所配保险丝规格和外形尺寸相同的保险丝来替换。

更换保险丝时应将本机与市电断开。

接地

本机仅可在接地良好的电源插头下操作。因为它要通过电源线的地线作为产品引线的地。该安全特征不可因无接地线的扩展线而中断。



注意！

本产品会产生危险电压。故非受训人员不能操作该产品，也不可打开产品外壳！而且那些可能产生危险电压的部件如有可能要用接地外壳遮盖，而且必须配一个可以中断连锁回路的触断器。

Installation

Before taking the unit into operation it is necessary to inspect the housing, the controls etc. for signs of physical damage.

The supplied Sub-D plug must be connected.

If any damage is found, the unit may not be operated on the mains. Disconnect the mains plug before opening the unit.



Servicing, repairs or calibrations should only be carried out by trained engineers.

The unit must be operated only on the voltage stipulated on the type plate. If it is necessary to change the fuse, it is imperative that it is only replaced by one of same value and physical dimensions as the original supplied fuse.

The unit must be disconnected from the mains whilst replacing the fuse.

Grounding

The unit may only be operated using a properly wired and grounded mains plug as the grounding of the unit leads via the earth line of the power cable. This safety feature must not be disabled by using an extension cable without a ground lead.



ATTENTION!

The unit generates hazardous voltages. It must not be operated by untrained personnel and not with open cover! Parts leading dangerous voltage should, if possible, be covered by a grounded cage which has a breaker contact that interrupts the interlock loop.

制冷

任何时候都必须保持空气流通顺畅，这点非常重要。

过温保护 (OT)

如果产品过热（如：风扇坏，进风孔和排气孔太脏等），产品将自动关闭，且"OT"灯会亮。产品冷却后又自动打开。

OT LED会指示模拟接口的LOCK信号没有连接。

环境条件

操作过程中，不论是满载操作还是恒定值操作，环境温度应在0...50°C之间。储存温度可为-40°C和+70°C。相对湿度不应超过90%，且无凝露。

Cooling

It is important that the air circulation remains unimpeded at all times.

Overtemperature protection (OT)

If the unit is overheated (e.g. fan defective, ventilation in- and outlets dirty etc.), it will automatically switch off and the LED "OT" will light on. After cooling down the unit will switch on automatically.

The OT LED also indicates that the LOCK signal on the analog interface (rear side of device) is not bridged.

Ambient conditions

During operation, at full load or constant operation, the ambient temperature may lie between 0...50°C. The storage temperature can be between -40°C and +70°C. The relative humidity should not exceed 90%, non-condensing.

设定电压和电流

输出电压和电流可通过前板的两个电位器进行粗调和细调。操作模式由两LED灯指示出来:

"CV" = 恒压 (绿灯)

"CC" = 恒流 (红灯)

输出电压 (外部电压) 的远程设定

远程设定输出电压时, 需按表格连接0...10V外部控制电压。0V外部电压相当于输出端上的0V电压。10V外部电压则相当于电源的额定输出电压。根据14页引脚分布连接外部电压。

此时前板上电压调节用电位器失去作用。

输出电流的远程设定

远程设定最大输出电流时, 需连接一0...10V外部控制电压。0V外部电压相当于输出端上的0A电流。10V外部电压则相当于电源的额定输出电流。根据14页引脚分布连接外部电压。

此时前板上电流调节用电位器失去作用。

经数字接口的远程控制

本机还可配上一IEEE总线接口或以太网接口。利用该接口可用电脑控制电压和电流。手动操作与远程控制之间的转换由发送给机器的第一个指令而自动转换。电源上的"EXTERN"灯指示为外控状态。

若需转回手动模式, 可使用"LOCAL"按钮 (仅针对IEEE总线)。或者用*RST指令, 它也可重设接口, 并将产品转回手动控制。

如果数字接口因某个原因没有反应, 可关闭产品然后再次打开。

本型号电源具有下列功能:

测量实际电压/电流

设定电压/电流值

待机 (输出开/关)

电流控制激活(CC)

Setting voltage and current

Output voltage and output current are adjustable with two potentiometers coarse and fine on the front panel. The operation mode is indicated by two LEDs:

"CV" = Constant Voltage (green)

"CC" = Constant Current (red)

Remote setting of the output voltage (ext. voltage)

For remote setting of the output voltage connect a external control voltage of 0...10V according to the table. An external voltage of zero volt (0V) is equivalent to 0V on the output, 10V external is equivalent to the nominal output voltage of the power supply. The external voltage is connected according to the pin assignment on page 15.

The potentiometer for voltage adjustment on the front panel is out of function.

Remote setting of the output current

For remote setting of the max. output current connect a external control voltage of 0...10V. An external voltage of zero volt (0V) is equivalent to 0A on the output, 10V external is equivalent to the nominal output current of the power supply. The external voltage is connected according to the pin assignment on page 15.

The potentiometer for current adjustment on the front panel is out of function.

Remote control via digital interface (optional)

The device can be optionally equipped with an IEEE bus or Ethernet interface. With this interface it is possible to control voltage and current by means of a computer. The change-over between manual operation and remote control happens automatically with the first command that is sent to the device. The LED "EXTERN" on the power supply will indicate the state of the external control.

To switch back to manual operation, pushbutton "LOCAL" can be used (only with the IEEE bus). Alternatively, the command *RST will also reset the interface and switch the device back to manual control.

In case the digital interface does not react anymore, due to any reason, switch the unit off and on again.

Following functions are available with this power supply:

Measure actual values of voltage/current

Set values of current/voltage

Standby(output on/off)

Current Control Active (CC)

B模式的指示

如果"CV"灯亮，本机可当恒压源操作。而"CC"灯则指示产品可当恒流源操作。这两种操作可自动转换。

过载保护和电流调整

输出端有连续短路保护功能。最大输出电流可从零连续上调至额定电流值。

远端编程输出电压和电流

通过模拟接口可从外部控制输出电压和电流，也可监控它们的实际值。最大额定电压和电流值被标准化成10V，对应100%的电压或电流。

监控线尾部应焊接一电阻和电容进行终止，比如：100k和470nF。监控输出端有短路保护，允许最大负载为1mA。连接线应屏蔽。屏蔽线必须连到引脚10 (GND)。

15针Sub-D插头外壳接到PE，但不可连到监控线的屏蔽线上。

电压和电流值都可通过高阻抗控制输入脚设定。

电压和电流这两个设定值可单独提供，也可以一起提供。如果只有一个用于远程控制，另一个则桥架到电位器前面。

打开电桥，并从外部电源或外部电位器供电0-10 V，给UPS或IPS供电，设备将自动处于远程控制状态。完成此操作，15针Sub-D插头的3和4引脚（电压）与5和6（电流）引脚需空着。使用外部电位器时，+参考电压脚（2脚）要连到电位器的一边，0V参考脚（1脚）则连到它的另外一边。电位器的滑动件需分别连到UPS 3脚（电压）和IPS 5脚。2脚和4脚不连。

在这些对应输出脚有下列监控信号：

引脚 7 = I_{MON} ，引脚 8 = U_{MON}

远程开/关直流输出

本机可通过控制输入脚SB（9脚）转至待机模式（输出电压被关断）。将9脚连到12脚的+5V即可实现，比如通过继电器。断开该连接后，输出被再次打开，并上升至预设值。

Mode indication

If the LED "CV" is lit, the unit operates as a constant voltage source, while the LED "CC" indicates that the unit is operating as a constant current source. The change-over happens automatically.

Overload protection and current regulation

The output is protected against a continuous short-circuit. The max. output current is continuously adjustable from zero up to the rated current.

Remote programming of output voltage and current

It is possible to control output voltage and current externally via the analogue interface as well to monitor the actual values externally. The maximum rated voltage and current values are standardized to 10V, corresponding to 100% U or I.

The end of the monitor cable should be terminated by a resistor and a capacitor, for example 100 KOhm and 470nF. The monitor outputs are short-circuit protected and the max. load is 1mA. The cable should be screened. The screen must be connected to Pin 10 (GND).

The housing of the 15-pole Sub-D plug is connected to PE and may not be connected to the screen of the monitor cable.

The voltage and current values can both be set via the high impedance control inputs.

The two set values of voltage and current can be supplied standalone but also together. In case only one is going to be used for remote control, the other is left bridged to the potentiometer on the front.

By opening the bridges and supplying the 0-10 V from an external source or external potentiometer to input UPS or IPS the device is automatically in remote control. To do that the connections on the supplied 15-pole plug on Pin 3 and 4 (for voltage) and Pin 5 and 6 (for current) must be opened. When using an external potentiometer, the + reference (pin 2) can be connected to one side of a potentiometer and the 0V reference (pin 1) to the other side of the potentiometer. The slider of the potentiometer is then connected to either UPS (pin 3, voltage) or IPS (pin 5, current). Pin 2 and Pin 4 are then left connected.

The monitor signals are available on the respective outputs. pin 7 = I_{MON} and pin 8 = U_{MON} .

Remotely switching the DC output on/off

Through the control input SB (Pin 9) the unit can be switched into standby mode (output voltage off). This is effected by connecting Pin 9 to +5V Pin 12, for example through a relay contact. After opening this connection the output is switched on again and rises up to the preset value.

前板

1. 电源开关

2. 输出开/关（待机）切换开关

位于**On**时 = 打开输出电压

位于**Off**时 = 关闭输出电压

3. 复位开关

用于恢复至OVP值。.

4. Preset/Normal OVP切换开关

开关位于"Preset"时，可用螺丝刀转动电位器 OVP (No. 5)

设定所需OVP极限值。设定完成后需调回正常操作模式！

5. OVP极限设定用电位器

该电位器用于设置OVP极限电压。

6. Local-本机开关

该开关可将IEEE总线模式调回标准模式。

7. Preset/Actual电压切换开关

开关位于"Preset"时，电压表13指示预设电压，用电位器9可调节。位于“Actual”时，指示实际电压。

8. Preset/Actual电流切换开关

开关位于"Preset"时，电流表14指示最大预设输出电流，用电位器12可调节。位于“Actual”时，指示实际电流。

9. 电压调节用电位器

该电位器用于调节输出电压。

10. 电流调节用电位器

该电位器用于调节最大输出电流。

11. 电压表

电压表显示预设电压、实际电压和OVP电压。

12. 电流表

电流表显示预设和实际输出电流。

Front panel

1. Mains switch

2. Switch output on/off (standby)

Position **on** = output voltage on

Position **off** = output voltage off

3. Reset switch

Serves to reset the OVP.

4. Switch Preset/Normal OVP

In position "Preset" the desired OVP threshold can be set by means of a screw driver with the trimmer OVP (No. 5) Switch back to normal operation after setting it!

5. Trimmer for setting OVP threshold

This trimmer sets the OVP threshold voltage.

6. Local

This switch is used to switch from IEEE bus mode back to standard mode.

7. Switch Preset/Actual Voltage

In position Preset the voltmeter 13 indicates the preset voltage, adjusted with potentiometer 9. In position Actual the actual voltage is indicated.

8. Switch Preset/Actual current

In position Preset the amperemeter 14 indicates the preset max. output current, adjusted with potentiometer 12. In position Actual the actual current is displayed.

9. Potentiometer Voltage

Potentiometer for the output voltage adjustment.

10. Potentiometer Current

Potentiometer for the max. output current.

11. Voltmeter

The voltmeter displays the preset, actual and the OVP voltages.

12. Ammeter

The ammeter displays the preset and the actual value of the output current.

操作提示

用这台高压电源给一台容性负载供电通常是没有问题的。但是由于产品内部构造，有下列限制：

- 不可在电源的直流输出端接上任何电容去给它们充电或放电。
- 根据产品型号的不同，其直流输出端允许最大容量也不同，分别为：
1,2 kV 型号：4 mF
2 kV 型号：1 mF
4 kV 型号：250 μ F
6 kV 型号：100 μ F
12 kV 型号：35 μ F

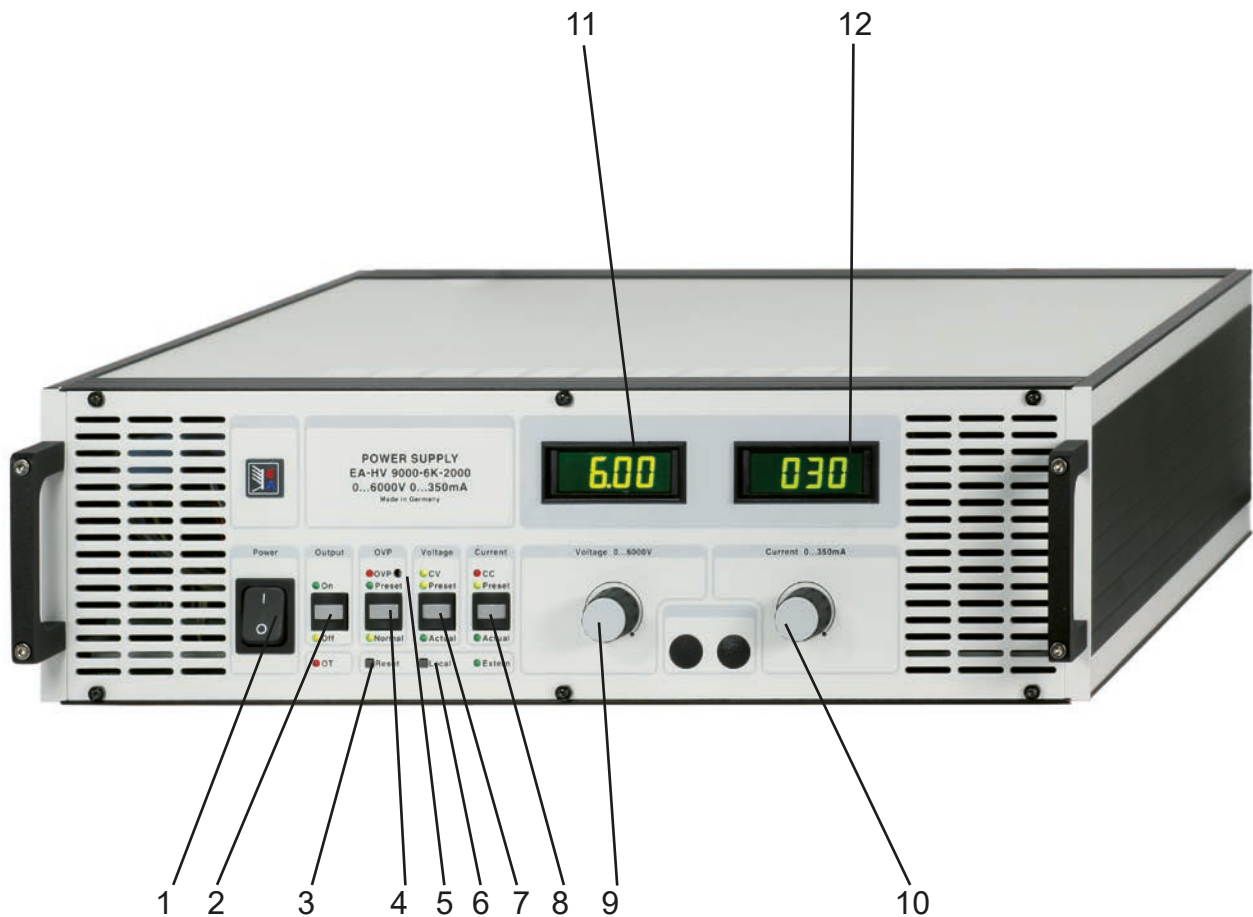
如果确实有需要连接更大的电容，必须在产品内部做些更改。这个更改可按照客户要求操作，但是必须在工厂内完成。
详情可与我们联系。

Notes for the operation

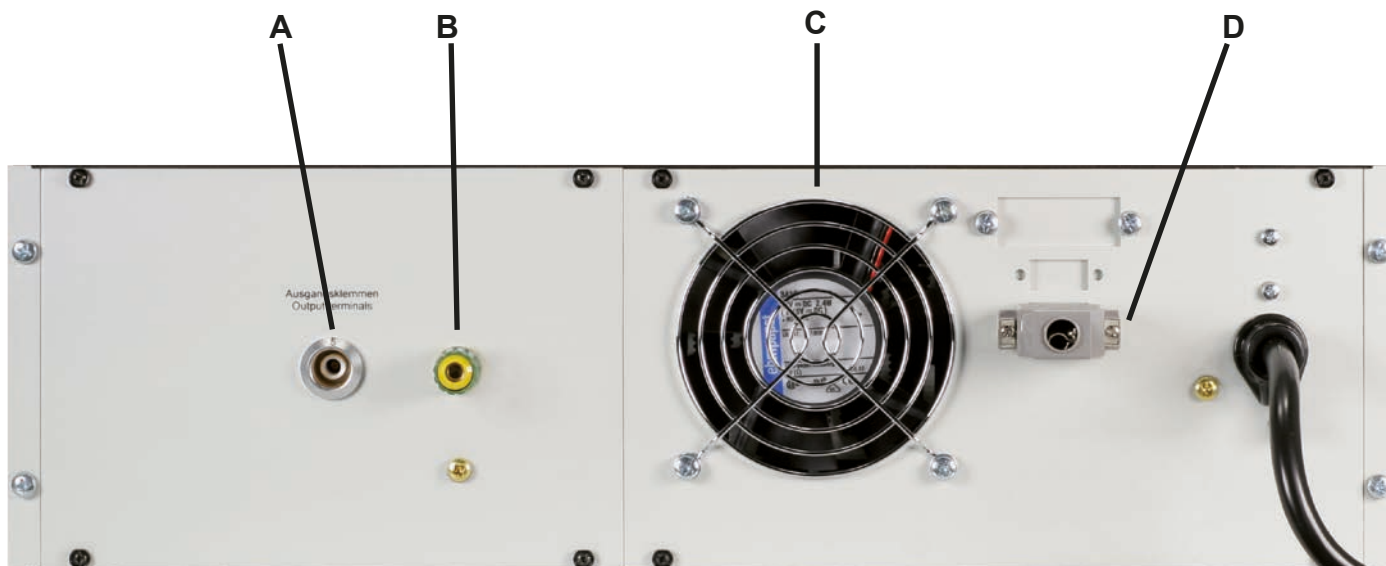
Operating the high voltage power supply with a capacitive load is not unproblematic. Due to the internal construction of the devices, following restrictions apply:

- It is not allowed to connect any capacity to the DC output, in order to charge/discharge it
- The max. allowed capacity on the DC output is depending on the model:
1,2 kV model: 4 mF
2 kV model: 1 mF
4 kV model: 250 μ F
6 kV model: 100 μ F
12 kV model: 35 μ F

In case it is absolutely required to connect higher capacities, the device would have to have an internal modification installed. This modification can be done upon request, but only in the factory.
Please contact us for details.



- 1 电源开关 / Mains switch
- 2 输出：开/关（待机） / Output: on/off (standby)
- 3 复位开关（重置 IEEE总线） / Reset (resets the IEEE bus)
- 4 Preset/Normal (调节 OVP值)切换开关 / Preset/Normal (adjustment OVP)
- 5 OVP极限调节用电位器 / Adjusting the OVP threshold
- 6 Local切换开关 (调回正常模式) (only IEEE) / Switch back to normal mode (only IEEE)
- 7 Preset/Actual 电压切换开关 / Voltage
- 8 Preset/Actual 电流切换开关 / Current
- 9 电压调节用电位器 / Voltage adjustment
- 10 电流调节用电位器 / Current adjustment
- 11 电压表 / Voltmeter
- 12 电流表 / Amperemeter



标准型号后视图 / Rear view of standard model

- A 高压输出插座的负极（而极性相反的则为输出插座的直流负极）
- B 接地插座（标准型号为直流负极，有些型号则为直流正极，极性相反）
- C 风扇排风口
- D 可选GPIB/RS232接口用插槽
- E 模拟接口（正常操作模式下需使用随附的桥式插头输出电压与电流）

- A DC+ output socket HV (resp. DC- output socket at models with reversed polarity)
- B Ground socket (DC- at standard models, DC+ at models with reversed polarity)
- C Air exhaust with fan
- D Slot for optional GPIB/RS232 interface
- E Analog interface (during normal operation used with included bridge plug for U and I)

模拟接口各引脚连接 (Sub-D, 15针)

1	0V- 参考
2	+ 参考 (0...10V)
3	UPS (预设输入电压, 0...10V)
4	UPOT (预设输出电压, 0...10V)
5	IPS (预设输入电流, 0...10V)
6	IPOT (预设输出电流, 0...10V)
7	IMON (实际输出电流, 0...10V)
8	UMON (实际输出电压, 0...10V)
9	SB (待机控制输入): +5V = 直流输出关闭 (待机), open = 直流输出开
10	GND (外部编程用参考地)
11	LOCK (安全回路/当HV负载用时失效)
12	+5V 输出 (待机模式下连到9脚)
13	不连接
14	+15V 输出
15	不连接

正常操作的基本设定

正常操作时, 模拟接口需进行下列连接:

3脚 - 4脚 (设定电压回路)

5脚 - 6脚 (设定电流回路)

10脚 - 11脚 (LOCK回路)

随附产品的Sub-D插头已做了上述连接。

后板输出端



按照极性不同, 连接中心触点的直流+ 或- 输出脚。屏蔽线连到安全地PE, 但决不可连到负载上。



(绿/黄色)

PE安全地, 负载连接的直流负极

接口 (按照设置)

24针插座

9针Sub-D连接器

15针Sub-D连接器

RJ45连接器

IEEE-Bus接口 (如有配)

RS-232接口 (如有配)

模拟接口 (需一直插上)

Ethernet-以太网端口 (如有配)

Analogue interface

in connection on the analogue interface, Sub-D 15 pole

1	0 V-Reference
2	+ Reference (0...10 V)
3	UPS (Voltage preset input, 0...10 V)
4	UPOT (Voltage potentiometer output, 0...10 V)
5	IPS (Current preset input, 0...10 V)
6	IPOT (Current potentiometer output, 0...10 V)
7	IMON (Actual current output, 0...10 V)
8	UMON (Actual voltage output, 0...10 V)
9	SB (Standby control input): +5 V = DC output off (standby), open = DC output on
10	GND (reference for external programming)
11	LOCK (safety loop / inhibit for HV load)
12	+5 V output (for standby mode connect to pin 9)
13	N.C.
14	+15 V output
15	N.C.

Fundamental settings for normal operation

For normal operation the following connections must be carried out on the analogue interface:

Pin 3 - Pin 4 (loop-through of voltage set value)

Pin 5 - Pin 6 (loop-through of current set value)

Pin 10 - Pin 11 (LOCK loop-through)

These connections are already made at the included Sub-D plug.

Output terminals on the rear side



DC+ or DC- output on the central contact, depending on polarity
The screen is connected to the safety ground PE and **must never be connected to the load!**



(green/yellow)

PE safety earth, used for DC- load connection

Interfaces (according to setup)

24-pole socket

9-pole Sub-D connector

15-pole Sub-D connector

RJ45 connector

IEEE bus interface (if equipped)

RS-232 interface (if equipped, always with IEEE or Ethernet)

Analogue interface (must always be plugged)

Ethernet port (if equipped)

其它

- 电源插头必须插进无障碍电源插座上。
- 输出端的极性可通过PCB "UMPOLER"从内部反接。该操作仅可由受训人员来执行。
- 用螺丝刀可从前板调节过压保护值(OVP)。按下"Preset"按钮该数值可显示于电压表上。若OVP被激活，可激活"Reset"按钮使本产品恢复至正常模式。
- 随附插头必须一直插到模拟接口插座上。见12页。

Other

- The mains plug must be connected into a free accessible mains socket.
- The polarity of the output can be internally reversed by means of the PCB "REVERSER". This may only be carried out by trained personnel.
- The overvoltage protection (OVP) can be adjusted on the front panel by means of a screw driver. The value can be indicated on the voltmeter after pressing the "Preset" button. In case the OVP is activated, the unit can be reset to normal operation by activating the "Reset" button.
- The included plug must always be plugged in to the analogue interface socket. See page 13.