



# HIGH VOLTAGE POWER SUPPLIES

HV-200

HV-400

HV2-200

Technical Description  
Rev. 2202

2022  
Lithuania



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### 1.1. Warranty Statement

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The HV power supplies are protected by a one-year warranty covering labor and parts. The warranty enters into validity since the shipment date. Any evidence of improper use or unauthorized repair attempts voids the warranty.

### 1.2. Service Contact Information

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For service/warranty requests, please contact:

EKSMA OPTICS, UAB  
c/o EKSMA Optics, UAB  
Dvarcioniu st. 2B  
LT-10233 Vilnius, Lithuania

Phone: +370 5 272 99 00  
Fax.: +370 5 272 92 99  
E-mail: [info@eksmaoptics.com](mailto:info@eksmaoptics.com)  
Website: [www.eksmaoptics.com](http://www.eksmaoptics.com)

## 2.1. General Information

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### 2.1.1. Models

The table below lists standard options. Custom voltage modifications may be delivered on request.

**Table 1. Models**

<i>Catalog number</i>	<i>Maximal HV output, kV</i>	<i>Maximal HV current, mA</i>
HV-200-1.8	1.8	110
HV-200-2.6	2.6	76
HV-200-3.6	3.6	55
HV-200-4.0	4.0	45
HV-400-1.8	1.8	220
HV-400-2.6	2.6	152
HV-400-3.6	3.6	110
HV-400-4.0	4.0	90
HV2-200-1.5	±1.5	±133
HV2-200-2.0	±2.0	±100
HV2-200-2.6	±2.6	±76
HV2-200-3.6	±3.6	±55

### 2.1.2. Main Components

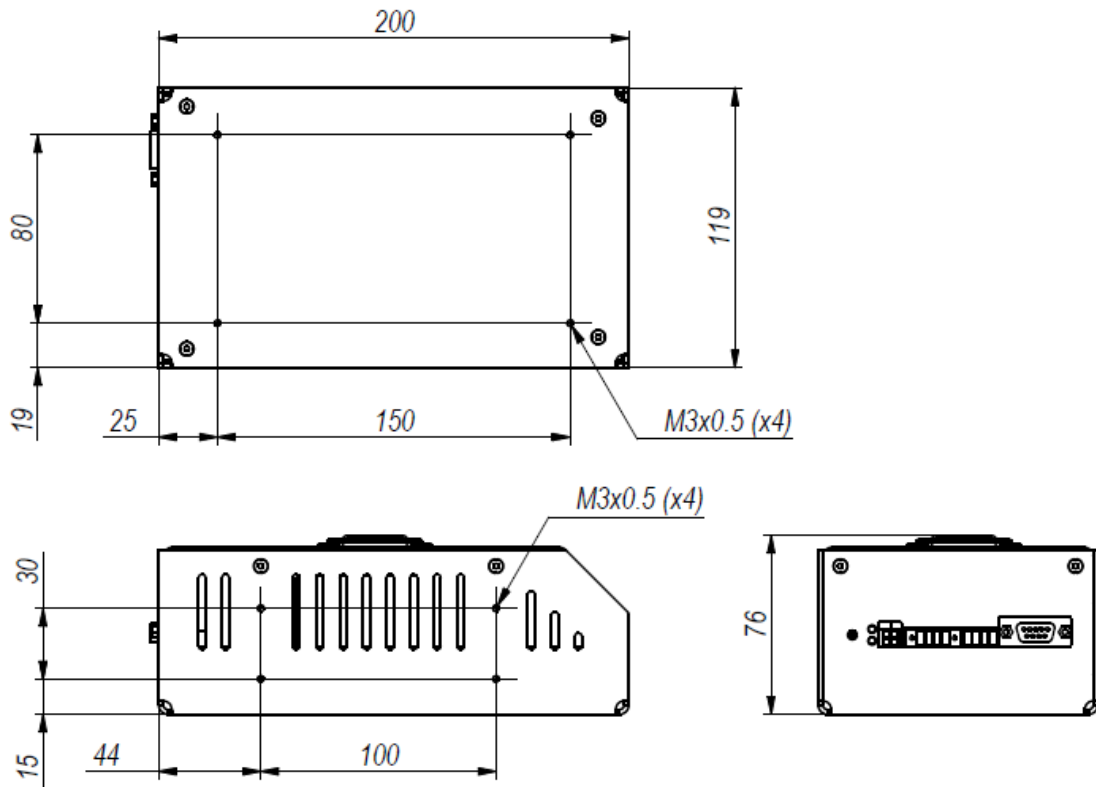
**Table 2. Main components**

<i>Component</i>	<i>Quantity</i>	<i>Notes</i>
High voltage (HV) power supply	1	-
Connector for DC input	1	-
+24V cable to Pockels cell driver	1	Optionally, if delivered in set with Pockels cell driver.
RS232 cable	1	Optionally, if RS232 control is requested
CAN cable	1	Optionally, if CAN control is requested
Technical description	1	-

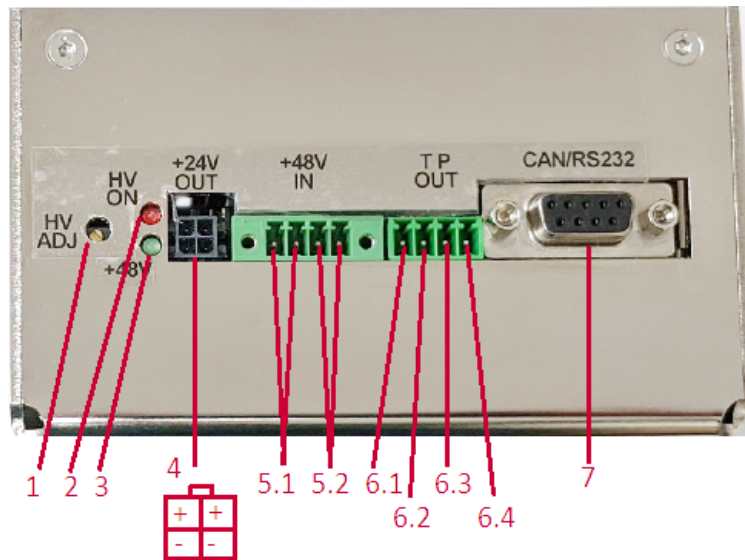
## 2.2. Technical Specifications

**Table 3.** Technical specifications

<i>Parameter</i>	<i>Value(s)</i>		
	<i>HV-200</i>	<i>HV-400</i>	<i>HV2-200</i>
Output voltage polarity	Positive		Bipolar
Maximum HV output power at maximal output voltage, <i>W</i>	200	400	2×200
Supply voltage DC requirements	47.5...55 V, 4.5 A	47.5...55 V, 9 A	
Output voltage ripple, %	< 0.3		
Output voltage control	CAN/RS232/Internal potentiometer		
Maximum +24V output current, <i>A</i>	1.2		
Maximum ambient temperature for operation, °C	45		
Dimensions, <i>mm</i>	See CHAPTER 3 DEVICE LAYOUT. 200×119×76		
Weight, <i>g</i>	1120		

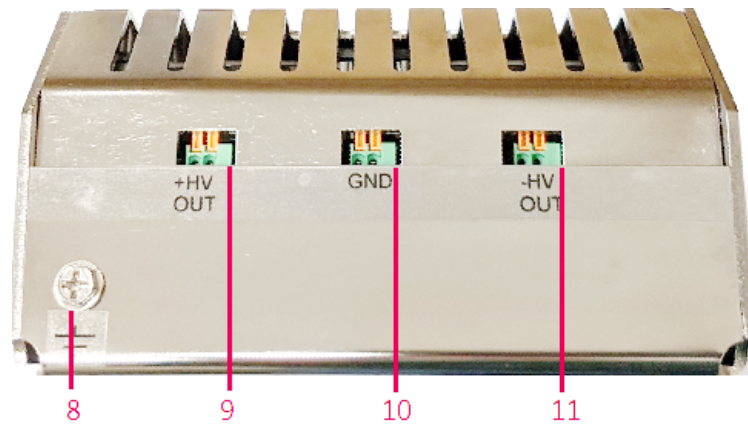


**Figure 1.** Outline drawing and dimensions of the HV power supply



**Figure 2.** Front controls of the HV power supply



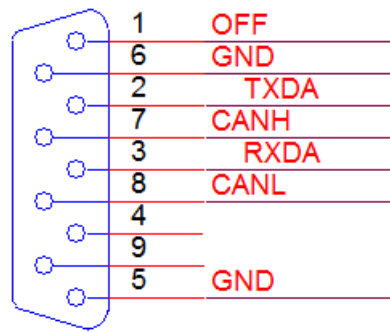


**Figure 3.** Rear controls of the HV power supply

**Table 4.** Controls and connections of the HV power supply

#	Port
1	Potentiometer for HV tuning in potentiometer mode
2	LED HV output on
3	LED +48V
4	+24V auxiliary output connector
5.1	2 pins for +48V input
5.2	2 pins for GND input (-48V)
6.1	Test point for -HV current monitoring (1V = 100mA)
6.2	Test point for +HV current monitoring (1V = 100mA)
6.3	Test point for +HV output monitoring (1V = 1kV)
6.4	Test point GND
7	CAN/RS232 connector
8	Grounding screw
9	+HV output
10	GND output
11	-HV output if equipped.

## CAN/RS232



DB9f

**Figure 4.** RS232/CAN connector pinout

Equipment is designed to be safe under normal environmental conditions according to 1.4.1.61010-1@IEC:2010 (Safety requirements for electrical equipment, control and laboratory use):

1. indoor use;
2. altitude up to 2000 m;
3. temperature 5°C to 35°C;
4. maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 35°C;
5. POLLUTION degree 1: no POLLUTION or only dry, non-conductive POLLUTION occurs.

**Warning:**

***The safety of the system incorporating driver and HV power supply is the responsibility of the assembler of the system.***

Operating the power supply is allowed to persons acquainted with the operation manual and having permission to deal with voltages over 1000 V.

Do not remove unit covers while power cable is connected to the mains (if applicable).

**WARNING**

***Direct contact with the exposed inner parts of the system when it is powered may cause human injuries or death.***

Do not operate the unit until it is **grounded** and the load is connected.

Do not use the unit if any defects have been detected.

### 5.1. Ground the HV Power Supply

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Provide the proper ground connection to ground screw (#8) of HV power supply.

### 5.2. Supply +48V Power

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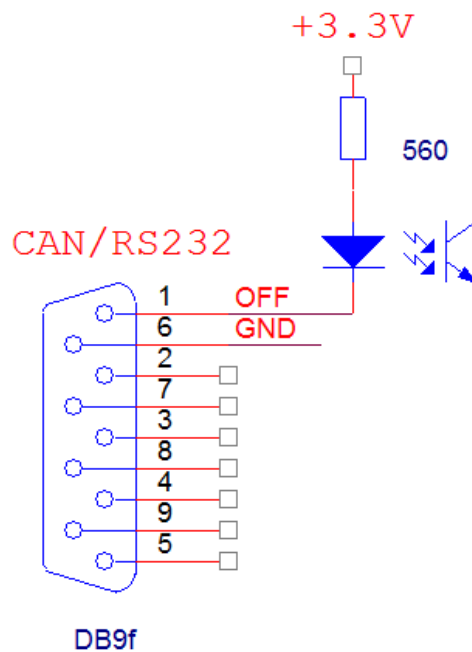
Connect the +48 VDC power supply to the HV power supply. See **Table 3** for requirements.

### 5.3. Set Required Output HV

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HV level may be tuned by:

1. Using internal (#1) trimmer potentiometer. Output voltage and current control is available on test point TP OUT connector pins (#6).
2. Using CAN or RS232, see CHAPTER 6 CONTROL VIA CAN/RS232 for details.
3. HV output can be switched off by connecting **pin 1** of connector CAN/RS232 (#7) to GND (pins 5, 6).



**Figure 5. ON/OFF control input**

### 5.4. Connect the Load

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Switch the DC power supply off. Connect the load. Check that the connection cables are firmly attached.

## 5.5. Check The DC Power Supply

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Switch the +48 VDC power on. Measure the voltage on +48 VDC input of HV power supply while HV power supply is loaded.

If the voltage measured is below +47V, use thicker wires, or increase the DC supply voltage to compensate voltage drop.

### 6.1. CAN

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CAN-USB converter is recommended for operation. It can be ordered from Eksma Optics. It comes together with „CAN Browser“ software and a set of required cables.



**Figure 6.** CAN-USB converter

1. Connect CAN-USB converter to PC and HV power supply by cables supplied.
2. Turn on +48V power supply.
3. Install and open CAN Browser.
4. Set required settings (see CHAPTER 7 CAN BROWSER ).

### 6.2. RS232

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1. Connect **HV** power supply to PC by the RS232 cable supplied. Note: do not attempt using ordinary RS232 cables. Some of them are not compatible with this series of HV power supplies.
2. Turn on +48V power supply.
3. Install and open CAN Browser.
4. Set required settings (see CHAPTER 7 CAN BROWSER ).
5. Refer document “ASCII serial protocol description” for details.

## Chapter 7 CAN BROWSER CONTROLS

Below tables 5 and 6 present list of registers that can be accessed and/or read-out using CAN Browser.

**Table 5. Basic controls**

<b>Setting</b>	<b>Description</b>
<b>Command</b>	Toggle the HV supply output ON/OFF
<b>Uset</b>	Set HV output value.
<b>Controller setup/Analog control</b>	Off – control HV supply via CAN/RS232.
	On – control HV supply by potentiometer.

**Table 6. Advanced control registers**

<b>Setting</b>	<b>Description</b>
<b>External off status</b>	Inactive – pin 1 of connector CAN/RS232 (#7) is <b>not</b> connected to ground.
	Active – pin 1 of connector CAN/RS232 (#7) is connected to ground. HV power supply output is turned off.
<b>Udisp</b>	Display HV output voltage.
<b>IsensP</b>	Display positive output current of HV supply.
<b>IsensM</b>	Display negative output current of HV supply.
<b>Tpcb</b>	Display PCB temperature of HV supply.
<b>Vpwr</b>	Display input +48 voltage.
<b>Vprog</b>	Display maximal HV value of output for potentiometer mode.
<b>Interlock/Vpwr max</b>	Display actual value of +48V maximal input. If DC input is over the maximal value (see <b>Table 3</b> ), HV power supply turns off.
<b>Interlock/Uout max</b>	Display setting of maximal HV output value. If this value is exceeded, HV power supply is off.
<b>Interlock/IsenseP max</b>	Display setting of positive output maximal current value. If this value is exceeded, HV power supply is off.
<b>Interlock/IsenseM max</b>	Display setting of negative output maximal current value. If this value is exceeded, HV power supply is off.
<b>Interlock/Tpcb max</b>	Display setting of PCB maximal temperature. If this value is exceeded, HV power supply is off.
<b>Interlock/Tunildm max</b>	Display setting of processor maximal temperature. If this value is exceeded, HV power supply is off.
<b>Controller setup/Uset limit</b>	Display setting of HV output limit.