

V45A

– Manual & Data Sheets–

- SYMMETRIC HIGH VOLTAGE AMPLIFIER
- 3 INPUTS (-10 V TO +10 V)
- 5 OUTPUTS (-65 V TO +65 V)



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The manual uses the following style declarations to visualize certain meanings:

Important notes are written in this style.

Technical parameters described in the text flow are written in this style.

Names of data channels or signals are written in this style.

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Attention: hazard voltages! Do not touch the output connectors!

1 TECHNICAL DATA

1.1 GENERAL FUNCTION

The V45A is a low-noise HV-amplifier designed for the control of tube scanners.

It takes three input voltages *In X*, *In Y* and *In Z* (-10 V to $+10\text{ V}$) and generates $-X$ and $-Y$ internally. In a 2nd stage, the five signals are amplified by a factor of 6,7. This enables its use as HV amplifier in scanning image acquisition applications, such as STM or AFM.

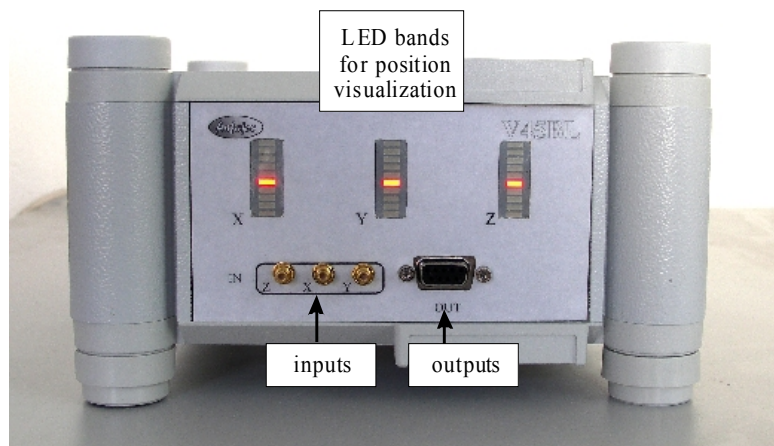


Figure 1: Front panel of the V45A

All input and output connectors as well as position indicators are available on the front panel

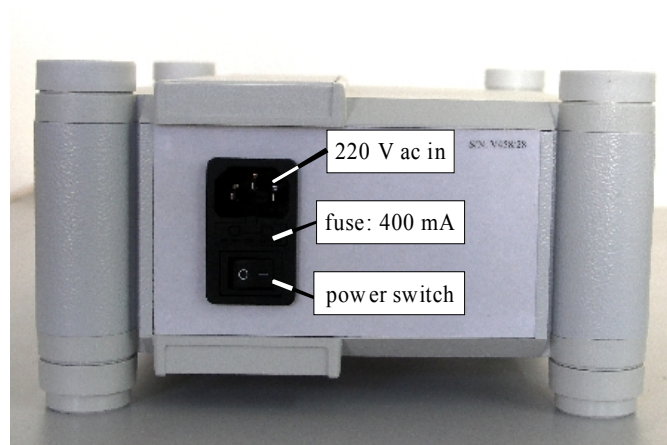


Figure 2: Back side panel of the V45A

Power supply, main fuse (400 mA) and power switch are at the backside.

1.2 SPECIFICATIONS

Power supply

Supply voltage	230 V ac, 50..60 Hz
Main Fuse	400 mA
Power Consumption	10 W
Isolation resistance R_{ISO}	> 299 MOhm
Short circuit resistance R_{PE}	0,13 Ohm

Signal Input

Voltage Input	SMB
Input Range	-10 V .. 10 V
Input Impedance	1,895 k Ω \pm 1 %
Damage Threshold	+/- 15 V

HV Output's

Maximum output voltage	- 65 V .. 65 V
Output noise	< 500 nV/Hz ^{0.5} @ 10 kHz see Data Plots B and < 3 mVpp @ full bandwidth Oscilloscope TDS3032B
Band width with 1 nF load	approx. 10 kHz (see data plot A)

1.3 LIST OF APPENDICES

- Test data sheet (noise and band width)

1.4 TECHNICAL DATA

For all measurements describes here, the offset is adjusted as close to zero as possible (abs (offset) < 50 mV).

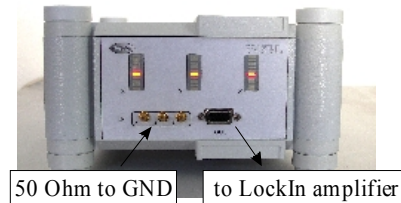
1.4.1 OUTPUT NOISE

- Diagram A: Spectral output noise density of all 5 channels vs. frequency

The related input is short-circuited with 50 Ohm vs. ground. The one output at a time is connected to the lock-in amplifier input.

eLockIn204 parameters:

time constant: 10/f, RollOff: 24 dB/oct
400 Hz to 1 MHz, 500 data points



1.4.2 BANDWIDTH

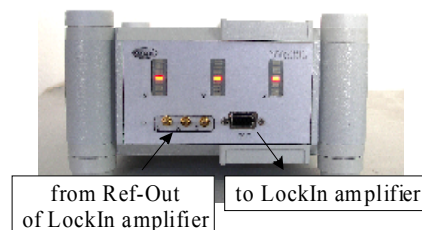
- Diagram B: Band width of all 5 channels

The inputs *In X, InY or InZ* are connected to the oscillator output of the lockin amplifier (10 mV_{rms}). The outputs *+Z, -X, +X, -Y or +Y* are plugged into the lock-in amplifier input.

External load: 1 nF

eLockIn204 parameters:

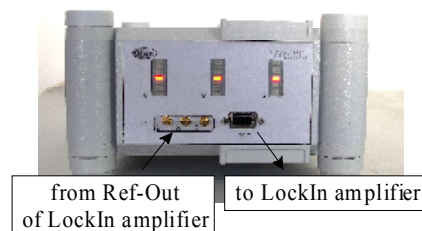
time constant: 10/f, RollOff: 24 dB/oct
400 Hz to 1 MHz, 500 data points



1.4.3 SMALL SIGNAL AMPLIFICATIONS

The gains were measured with a 10 mV_{rms} sine wave with 1 kHz frequency applied to *InX, InY or InZ*, respectively, while the related outputs are connected one after each other to the lockin amplifier input of an eLockin204.

The numbers written in the table are the averaged outputs of the lockin amplifier displayed on the oscilloscope screen of the eLockin204 with 100 ms/div time scale:



<i>Channel</i>	<i>Gain</i>
+ X	6,7
- X	6,7
+ Y	6,7
- Y	6,7
+ Z	6,7

1.4.4 9-PIN OUTPUT CONNECTOR.

Steckverbinder am Ausgang des V45A

