

# NHS High Precision HV Modules 6 Channels with Common-GND

## Technical Data



## **Attention!**

-It is not allowed to use the unit if the covers have been removed.

-We decline all responsibility for damages and injuries caused by an improper use of the module. It is highly recommended to read the manual before any kind of operation.

## **Note**

The information in this manual is subject to change without notice. We take no responsibility for any error in the document. We reserve the right to make changes in the product design without notification to the users.

Filename NHS62xx as of 2012-10-19

The NHS modules of this series are High Precision multichannel high voltage power supplies in 1/12 NIM standard cassette. The output voltage features an exceptionally high stability, lowest ripple and a very small temperature coefficient. The extreme small ripple is ensured down to very low frequencies (below 0.1Hz). Each single channel has an independent voltage and current control. The current measurement includes two measurement ranges with a resolution down to a few picoampere.

The module provides full front panel control and visualization via a 1.44" TFT-display. A remote control via USB or CAN is also possible. The data for set and measure values are given in a format of Floating Point Single Precision values. The modules are equipped with 24 bit ADC and 20 bit DAC circuits.

The channels share a Common-GND, which is connected to the internal Crate-Ground.

The HV outputs via SHV connectors are located on the rear panel.

	NHS 62 10x <sup>1)</sup>	NHS 62 20x <sup>1)</sup>	NHS 62 30x <sup>1)</sup>	NHS 62 40x <sup>1)</sup>	NHS 62 60x <sup>1)</sup>
Output voltage $V_{O\ nom}$ [kV]	1	2	3	4	6
Output current $I_{O\ nom}$ [mA]	8	4	3	2	1
Resolution of voltage setting <sup>*)</sup> [mV]	1	10	10	10	10
current setting <sup>*)</sup> [nA]	10	10	10	10	10
voltage measurement <sup>*)</sup> [mV]	2	5	10	10	10
current measurement <sup>*)</sup> [nA]	20	10	5	4	2
1 <sup>st</sup> range: $I_{nom} \geq I_o > 20\ \mu A$					
current measurement <sup>*)</sup> [pA]	50	50	50	50	50
2 <sup>nd</sup> range: $20\ \mu A \geq I_o > 0$					
<sup>*)</sup> with standard sample rate 50/s and digital filter 64					
Ripple and noise [mV <sub>P-P</sub> ]	<5				<20
	- at max. load and $ V_o  > 1\% * V_{O\ nom}$ - $f > 10\ Hz$				
Stability (no load/load and $\Delta V_{IN}$ )	$< 1 * 10^{-4} * V_{O\ nom}$				
Sample rates [samples/s]	5, 10, 25, 50, 60, 100, 500				
Digital filter averages	1, 16, 64, 256, 512, 1024				
The resolution of measurable values depends on the settings of the sampling rate and the digital filter!					
Accuracy of voltage measurement	$\pm (0.01\% * V_o + 0.01\% * V_{O\ nom})$				
Accuracy of current measurement	1 <sup>st</sup> range: $I_{nom} \geq I_o > 20\ \mu A$ $\pm (0.01\% * I_o + 0.01\% * I_{O\ nom})$		2 <sup>nd</sup> range: $20\ \mu A \geq I_o > 0$ $\pm (0,1\% * I_o + 1\ nA)$		
The measurement accuracy is guaranteed in the range $1\% * V_{O\ nom} < V_o \leq V_{O\ nom}$ and for 1 year					
Voltage ramp up / down [V/s]	$1 * 10^{-6} * V_{O\ nom}$ up to $0.2 * V_{O\ nom}$				
Temperature coefficient	$< \pm 50 * 10^{-6}/K$				
Hardware limits $V_{max} / I_{max}$	potentiometer per module ( $V_{max} / I_{max}$ is the same for all channels)				

<sup>1)</sup> x=p polarity positive, x=n polarity negative

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Interface	USB-Interface (potential free) CAN-Interface (potential free)								
Operating modes	Full module and channel control via: - Front panel - USB interface: iseg SCPI - CAN interface: EDCP (Enhanced Device Control Protocol)								
Status (for each channel)	green LED turns on if the channel has the status "Ready" yellow LED turns on if the channel has the status "HV ON"								
HV output protection	Overload, short-circuit and arc protection; only one short-circuit or arc per second allowed.								
Protection loop (I <sub>s</sub> ) potential free (2 pin Lemo-socket and REDEL SL)	5 mA < I <sub>s</sub> < 20 mA ⇒ module on I <sub>s</sub> < 0.5 mA ⇒ module off								
INHIBIT per channel	Via Sub-D-9 connector (TTL level)								
INHIBIT 0-5 / Channel	0	1	2	3	4	5	GND	GND	GND
Sub-D-9 connector / PIN	1	2	3	4	5	6	7	8	9
	1.5 A								
Power requirements V <sub>INPUT</sub> +5 V	0.3 A								
Packing	1/12 NIM standard cassette								
HV connector	SHV connectors on rear panel								
Operating temperature	0 ... +40 °C								
Storage temperature	-20 ... +60 °C								

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