

NHS Standard HV Modules
NHS 60vvx¹
6 Channels with Common-GND
Technical Data



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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 NHS60xx as of 2014-06-05

1. General information

The NHS modules of this series are Standard multichannel high voltage power supplies in 1/12 NIM standard cassette. The output voltage features a high stability, low ripple and noise and low temperature coefficient. Each single channel has an independent voltage and current control. 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 (or BNC connector for NHS 6001x) connectors are located on the rear panel.

2. Technical data

	NHS 6001x ¹⁾	NHS 6005x ¹⁾	NHS 6010x ¹⁾	NHS 6020x ¹⁾	NHS 6030x ¹⁾	NHS 6040x ¹⁾	NHS 6060x ¹⁾	
Output voltage $V_{O\text{ nom}}$ [kV]	0.1	0.5	1	2	3	4	6	
Output current $I_{O\text{ nom}}$ [mA]	10	15	8	4	3	2	1	
Resolution of voltage setting ^{*)} [mV]	1	2	4	5	10	10	15	
current setting ^{*)} [nA]	100	150	80	40	30	20	10	
voltage measurement ^{*)} [mV]	1	2	4	5	10	10	15	
current measurement ^{*)} [nA]	100	150	80	40	30	20	10	
Ripple and noise [mV _{P-P}]	< 5	< 10					< 30	
	- at max. load and $ V_O > 1\% * V_{O\text{ nom}}$ - $f > 10\text{ Hz}$							
Stability (no load/load and ΔV_{IN})	$< 1 * 10^{-4} * V_{O\text{ nom}}$							
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	$\pm (0.01\% * V_O + 0.02\% * V_{O\text{ nom}})$							
Accuracy of current measurement	$\pm (0.01\% * I_O + 0.02\% * I_{O\text{ nom}})$							
The measurement accuracy is guaranteed in the range $1\% * V_{O\text{ nom}} < V_O \leq V_{O\text{ nom}}$ and for 1 year								
Voltage ramp up / down [V/s]	$1 * 10^{-6} * V_{O\text{ nom}}$ up to $0.2 * V_{O\text{ nom}}$							
Temperature coefficient	$< \pm 50 * 10^{-6}/K$							
Hardware limits $V_{\text{max}} / I_{\text{max}}$	potentiometer per module ($V_{\text{max}} / I_{\text{max}}$ is the same for all channels)							

^{*)} with standard sample rate 50/s and digital filter 64

¹⁾x = p: polarity positive, ¹⁾x = n: polarity negative

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HV connector	BNC opt. SHV	SHV opt. BNC	SHV connectors on rear panel						
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_s) potential free (2 pin Lemo-socket and REDEL SL)	$5 \text{ mA} < I_s < 20 \text{ mA} \Rightarrow$ module on $I_s < 0.5 \text{ mA} \Rightarrow$ 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	6	7	8	4	5	9
Power requirements $V_{\text{INPUT}} \pm 24 \text{ V}$	1.5 A (0.6 A for NHS 6001x) at full load 0.3 A with no load at nominal voltage								
Power requirements $V_{\text{INPUT}} + 5 \text{ V}$	0.3 A								
Packing	1/12 NIM standard cassette								
	SHV connectors on rear panel								
Operating temperature	0 ... +40 °C								
Storage temperature	-20 ... +60 °C								

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