

# HTP-NHQ

## NIM HIGH VOLTAGE PSU



POSITIVE PROBLEM SOLVING **+ =**

The HTP-NHQ are a series of single and dual channel high voltage PSUs built to the NIM format. Where a 2 channel unit is specified each channel can be adjusted independently.

These units are often found in sensing and detection systems where low noise and high stability are paramount. Typical applications include medical, nuclear and particle physics along with vacuum technology. The output polarity can be switched and the voltage ramp time adjusted via computer interface after switch on. All HTP-NHQ models feature recessed 10 position limit switches for both voltage and current. These can be set to help protect sensitive loads against accidental user error.

- + High Voltage Power Supplies in 1/12 NIM Standard Cassette
- + High Precision, Standard and Low Cost Versions Available
- + Remote Control via RS-232, CAN or Analogue Interface
- + Single and Dual Channel Versions Available
- + Adjustable Voltage Ramp
- + Switchable Polarity

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## FURTHER DETAILS

The HTP-NHQ is available in three versions. The standard range offers a measurement resolution of 1V and up to 100nA. The high precision units offers superior current resolution into the nano-amp and pico-amp ranges with excellent stability.

A 'Kill' feature can also be enabled so that the output will automatically switch off when a preset current limit is reached. The 'inhibit' socket allows an external TTL signal to be used to switch the output OFF/ON.

RS232 or CAN interfaces are provided on the standard and high precision versions. These interfaces provide full adjustment of the current limit. A windows based GUI is available for operating the units from a PC. An OPC system with integrated OPC server is available to aid integration in to larger systems. LabVIEW drivers are also available along with C++ and DLL files. The low cost version has an analogue interface for setting and monitoring the voltage.

### 19" NIM CRATES

	N-C-2010	N-C-2020	N-C-2030	N-C-2030 A	N-C-2040	N-C-2040 B
Power Total	Max. 90W	Max. 200W	Max. 300W	Max. 300W	Max. 400W	Max. 400W
NIM slots	6	12	12	12	12	12
at ±6V	Each 2A	Each 5A	Each 10A	Each 1.5A	Each 10A	Each 1.5A
at ±12V	Each 1A	Each 2A	Each 2A	Each 2A	Each 2A	--
at ±24V	Each 0.5A	Each 1A	Each 2A	Each 6A	Each 4A	Each 10A

Every effort is made to ensure that the information provided within this technical summary is accurate. However, ETPS Ltd must reserve the right to make changes to the published specifications without prior notice. Where certain operating parameters are critical for your application we advise that they be confirmed at the time of order. ETPS Ltd specialises in modifying its proven platforms to suit your needs. Please contact our office if your requirement is non-standard. Please note that your actual unit may differ from those shown.

## HIGH PRECISION SELECTION TABLE

Part Number	Output Voltage	Output Current	Max Power [Each Channel]	Interface Type	Number of Channels
HTP-NHQ 122M	0 - 2kV	0 - 6mA	12W	RS232	Single
HTP-NHQ 222M	0 - 2kV	0 - 6mA	12W	RS232	Dual
HTP-NHQ 142M	0 - 2kV	0 - 6mA	12W	CAN	Single
HTP-NHQ 242M	0 - 2kV	0 - 6mA	12W	CAN	Dual
HTP-NHQ 123M	0 - 3kV	0 - 4mA	12W	RS232	Single
HTP-NHQ 223M	0 - 3kV	0 - 4mA	12W	RS232	Dual
HTP-NHQ 143M	0 - 3kV	0 - 4mA	12W	CAN	Single
HTP-NHQ 243M	0 - 3kV	0 - 4mA	12W	CAN	Dual
HTP-NHQ 124M	0 - 4kV	0 - 3mA	12W	RS232	Single
HTP-NHQ 224M	0 - 4kV	0 - 3mA	12W	RS232	Dual
HTP-NHQ 144M	0 - 4kV	0 - 3mA	12W	CAN	Single
HTP-NHQ 244M	0 - 4kV	0 - 3mA	12W	CAN	Dual
HTP-NHQ 125M	0 - 5kV	0 - 2mA	10W	RS232	Single
HTP-NHQ 225M	0 - 5kV	0 - 2mA	10W	RS232	Dual
HTP-NHQ 145M	0 - 5kV	0 - 2mA	10W	CAN	Single
HTP-NHQ 245M	0 - 5kV	0 - 2mA	10W	CAN	Dual
HTP-NHQ 126L	0 - 6kV	0 - 1mA	6W	RS232	Single
HTP-NHQ 226L	0 - 6kV	0 - 1mA	6W	RS232	Dual
HTP-NHQ 146L	0 - 6kV	0 - 1mA	6W	CAN	Single
HTP-NHQ 246L	0 - 6kV	0 - 1mA	6W	CAN	Dual

## HIGH PRECISION TECHNICAL DATA

GENERAL	
Ripple & Noise [x22M, x23M, x24M, x42M, x43M, x44M]	2mV <sub>p-p</sub>
Ripple & Noise [x25M, x26L, x45L, x46L]	5mV <sub>p-p</sub>
Resolution of Voltage Measurement (Display)	1V
Resolution of Voltage Measurement (via Interface)	100mV (optional 10mV up to 4kV)
Resolution of Current Measurement (Display)	1µA (option /104 = 10nA) (option /ON1 = 1nA)
Resolution of Current Measurement (via Interface)	100nA (option /104 = 1nA) (option /ON1 = 100pA)
Voltage Accuracy (for One Year)	± [0.05% V <sub>O</sub> + 0.02% V <sub>OMAX</sub> + 1 digit]
Current Accuracy (for One Year)	± [0.05% I <sub>O</sub> + 0.02% of range + 1 digit]
Stability (ΔV <sub>O</sub> / ΔV <sub>IN</sub> )	< 3 × 10 <sup>-5</sup> × V <sub>OMAX</sub>
Stability Load, No Load (ΔV <sub>O</sub> )	< 5 × 10 <sup>-5</sup> × V <sub>OMAX</sub>
Temperature Coefficient	< 3 × 10 <sup>-5</sup> /K
LCD Display	4 digit for voltage or current (selectable)
Voltage Setting	Manual: 10 turn potentiometer DAC: via interface (selectable)
Ramp Speed at HV On/Off	Hardware ramp: 500V/s
Ramp Speed via Interface	Software ramp: 2 - 255V/s
Protection	Separate current & voltage limit, INHIBIT, current trip
INHIBIT	Per channel (TTL Low)
Power Requirements V <sub>IN</sub>	±24VDC (<800mA single ch. <400mA) ±6V(<100mA)(option /N24 without 6V)
Output Polarity	Switchable
Connector	SHV

## HIGH PRECISION OPTIONS

CODE	DESCRIPTION
/ON1 [Only Available With /2MA OR /2MM]	10µA current range with resolution of 1nA via display and 100pA via interface
/104	100µA current range with resolution of 10nA via display and 1nA via interface
/2MA	2 current measurement ranges with automatic crossover
/2MM	2 current measurement ranges with manual selection
/N24	Only ± 24VDC Input. (No ± 6VDC Input)
/NHQxxxN	Output power increased to 30W per channel (up to 3kV)
/VHR	10mV voltage measurement resolution via interface (up to 4kV)

# HTP-NHQ

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### LOW COST MODEL SELECTION TABLE

Part Number	Output Voltage	Output Current	Max Power (Each Channel)	Interface Type	Number of Channels
HTP-NHQ 112M	0 - 2kV	6mA	12W	Analogue	Single
HTP-NHQ 212M	0 - 2kV	6mA	12W	Analogue	Dual
HTP-NHQ 113M	0 - 3kV	4mA	12W	Analogue	Single
HTP-NHQ 213M	0 - 3kV	4mA	12W	Analogue	Dual
HTP-NHQ 114M	0 - 4kV	3mA	12W	Analogue	Single
HTP-NHQ 214M	0 - 4kV	3mA	12W	Analogue	Dual
HTP-NHQ 115M	0 - 5kV	2mA	10W	Analogue	Single
HTP-NHQ 215M	0 - 5kV	2mA	10W	Analogue	Dual
HTP-NHQ 116L	0 - 6kV	1mA	6W	Analogue	Single
HTP-NHQ 216L	0 - 6kV	1mA	6W	Analogue	Dual

### LOW COST MODE TECHNICAL DATA

GENERAL	
Ripple & Noise	50mV <sub>p-p</sub>
Resolution of Voltage Measurement	1V (display)
Resolution of Current Measurement [Display] (x12M, x13M)	1µA (option 104 = 100nA)
Voltage / Current Accuracy (for One Year)	Voltage = ± (0.1% V <sub>O</sub> + 1 digit); Current = ± (0.1% I <sub>O</sub> + 1 digit)
Stability (ΔV <sub>O</sub> / ΔV <sub>IN</sub> )	< 1 × 10 <sup>-4</sup> × V <sub>OMAX</sub>
Stability Load, No Load [ΔV <sub>O</sub> ]	< 2 × 10 <sup>-4</sup> × V <sub>OMAX</sub>
Temperature Coefficient	< 1 × 10 <sup>-4</sup> /K
LCD Display	4 digit for voltage or current (selectable)
Voltage Setting	Manual: 10 turn potentiometer interface or analogue interface
Ramp Speed at HV On/Off	Hardware ramp: 500V/s
Protection	Separate current & voltage limit, INHIBIT
INHIBIT	Per channel (TTL Low)
Power Requirements V <sub>IN</sub>	±24VDC (<800mA single ch. <400mA) ±6V(<100mA)[option /N24 without 6V]
Connector	SHV

### LOW COST MODE OPTIONS

CODE	DESCRIPTION
/104	100µA current range with resolution of 10nA via display and 1nA via interface
/N24	Only ± 24VDC Input. (No ± 6VDC Input)
/NHQxxxN	Output power increased to 30W per channel (up to 3kV)



## STANDARD MODEL SELECTION TABLE

Part Number	Output Voltage	Output Current	Max Power [Each Channel]	Interface Type	Number of Channels
HTP-NHQ 102M	0 - 2kV	0 - 6mA	12W	RS232	Single
HTP-NHQ 202M	0 - 2kV	0 - 6mA	12W	RS232	Dual
HTP-NHQ 132M	0 - 2kV	0 - 6mA	12W	CAN	Single
HTP-NHQ 232M	0 - 2kV	0 - 6mA	12W	CAN	Dual
HTP-NHQ 103M	0 - 3kV	0 - 4mA	12W	RS232	Single
HTP-NHQ 203M	0 - 3kV	0 - 4mA	12W	RS232	Dual
HTP-NHQ 133M	0 - 3kV	0 - 4mA	12W	CAN	Single
HTP-NHQ 233M	0 - 3kV	0 - 4mA	12W	CAN	Dual
HTP-NHQ 104M	0 - 4kV	0 - 3mA	12W	RS232	Single
HTP-NHQ 204M	0 - 4kV	0 - 3mA	12W	RS232	Dual
HTP-NHQ 134M	0 - 4kV	0 - 3mA	12W	CAN	Single
HTP-NHQ 234M	0 - 4kV	0 - 3mA	12W	CAN	Dual
HTP-NHQ 105M	0 - 5kV	0 - 2mA	10W	RS232	Single
HTP-NHQ 205M	0 - 5kV	0 - 2mA	10W	RS232	Dual
HTP-NHQ 135M	0 - 5kV	0 - 2mA	10W	CAN	Single
HTP-NHQ 235M	0 - 5kV	0 - 2mA	10W	CAN	Dual
HTP-NHQ 106L	0 - 6kV	0 - 1mA	6W	RS232	Single
HTP-NHQ 206L	0 - 6kV	0 - 1mA	6W	RS232	Dual
HTP-NHQ 136L	0 - 6kV	0 - 1mA	6W	CAN	Single
HTP-NHQ 236L	0 - 6kV	0 - 1mA	6W	CAN	Dual
HTP-NHQ 108L	0 - 8kV	0 - 1mA	8W	RS232	Single
HTP-NHQ 208L	0 - 8kV	0 - 1mA	8W	RS232	Dual
HTP-NHQ 138L	0 - 8kV	0 - 1mA	8W	CAN	Single
HTP-NHQ 238L	0 - 8kV	0 - 1mA	8W	CAN	Dual
HTP-NHQ 1010x	0 - 10kV	0 - 0.5mA	5W	RS232	Single
HTP-NHQ 2010x	0 - 10kV	0 - 0.5mA	5W	RS232	Dual

## STANDARD MODEL TECHNICAL DATA

### GENERAL

Ripple & Noise	2mV <sub>pp</sub> [x02M, x03M, x04M, x32M, x33M, x34M]; 5mV <sub>pp</sub> [x05M, x06L, x35M, x36L]; 50mV <sub>pp</sub> [x08L, x38L, x010x]
Resolution of Voltage Measurement	1V for display and via interface
Resolution of Current Measurement	1µA [option /104 = 100nA] for display and via interface
Resolution of Current Measurement (via Interface)	100nA [option /104 = 1nA] [option /ON1 = 100pA]
Voltage / Current Accuracy (for One Year)	Voltage = ± [0.05% V <sub>o</sub> + 0.02% V <sub>OMAX</sub> + 1 digit]; Current = ± [0.05% I <sub>o</sub> + 0.02% of range + 1 digit]
Stability [ΔV <sub>o</sub> / ΔV <sub>IN</sub> ]	< 5 × 10 <sup>-5</sup> × V <sub>OMAX</sub>
Stability Load, No Load [ΔV <sub>o</sub> ]	< 5 × 10 <sup>-5</sup> × V <sub>OMAX</sub>
Temperature Coefficient	< 5 × 10 <sup>-5</sup> /K
LCD Display	4 digit for voltage or current (selectable)
Voltage Setting	Manual: 10 turn potentiometer DAC: via interface (selectable)
Ramp Speed at HV On/Off	Hardware ramp: 500V/s
Ramp Speed via Interface	Software ramp: 2 - 255V/s
Protection	Separate current & voltage limit, INHIBIT, current trip
INHIBIT	Per channel [TTL Low]
Power Requirements V <sub>IN</sub>	±24VDC (<800mA single ch. <400mA) ±6V(<100mA)[option /N24 without 6V]
Output Polarity	Switchable
Connector	SHV

## STANDARD MODEL OPTIONS

CODE	DESCRIPTION
/104	100µA current range with resolution of 10nA via display and 1nA via interface
/N24	Only ± 24VDC Input. (No ± 6VDC Input)
/NHQxxxN	Output power increased to 30W per channel (up to 3kV)
/VHQ x0xx-h	Output current doubled



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