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NHQ

NIM High Voltage PSU

Description

The NHQ are a series of single and dual channel high voltage power supplies built to the NIM format. 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. The NHQ is available in three versions. The standard range offers a measurement resolution of 1V and up to 100nA. The high precision offers superior voltage and current resolution with high stability. RS232 or CAN interfaces are provided along with the ability to set the current limit for these two versions. The low cost version has an analogue interface for setting and monitoring the voltage. Where a 2 channel unit is specified each channel can be independently adjusted.



- High voltage power supplies in 1/12 NIM standard cassette
- High Precision, Standard and Low Cost Versions available
- Remote control via RS232, CAN or analogue interface
- 1 & 2 channel versions available
- Adjustable voltage ramp
- Switchable polarity

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Selection Table

High Precision Models

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

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

Technical Data

Ripple & noise (22M, 23M, 24M, 42M, 43M, 44M).....	2mV _{pp}
Ripple & noise (25M, 26L, 45L, 46L).....	5mV _{pp}
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 _o + 0.02% V _{o,max} + 1 digit)
Current accuracy (for one year).....	± (0.05% I _o + 0.02% of range + 1 digit)
Stability (?V _o /?V _{IN}).....	< 3 x 10 ⁻⁵ x V _{o,max}
Stability load, no load (?V _o).....	< 5 x 10 ⁻⁵ x V _{o,max}
Temperature coefficient.....	< 3 x 10 ⁻⁵ /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 _{IN}	±24VDC (<800mA single ch. <400mA) ±6V(<100mA) (option N24 without 6V)
Output polarity.....	Switchable

Options Table

Code	Description
/104.....	100µA current range with resolution of 10nA via display and 1nA via interface
/ON1 (only available with 2MA or 2MM).....	10µA current range with resolution of 1nA via display and 100pA via interface
/2MA.....	2 current measurement ranges with automatic crossover
/2MM.....	2 current measurement ranges with manual selection
/VHR.....	10mV voltage measurement resolution via interface up to 4kV
/N24.....	Only ±24Vdc Input. (No ±6Vdc Input)
/NHQxxxN.....	Output power increased to 30W per channel (only up to 3kV)



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Selection Table

Standard Models

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

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

Technical Data

Ripple & noise (02M, 03M, 04M, 32M, 33M, 34M).....	2mV _{p-p}
Ripple & noise (05M, 06L, 35M, 36L).....	5mV _{p-p}
Ripple & noise (08L, 38L).....	200mV _{p-p}
Resolution of voltage measurement (Display).....	1V
Resolution of voltage measurement (via Interface).....	1V
Resolution of current measurement (Display).....	1µA (option 104 = 100nA)
Resolution of current measurement (via Interface).....	1µA (option 104 = 100nA)
Voltage accuracy (for one year).....	± (0.05% V _O + 0.02% V _{O max} + 1 digit)
Current accuracy (for one year).....	± (0.05% I _O + 0.02% of range + 1 digit)
Stability (?V _O /?V _{IN}).....	< 5 x 10 ⁻⁵ x V _{OMAX}
Stability load, no load (?V _O).....	< 5 x 10 ⁻⁵ x V _{OMAX}
Temperature coefficient.....	< 5 x 10 ⁻⁵ /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 _{IN}	±24V (<800mA single ch. <400mA) or ±6V (100mA) (option N24 without 6V)
Output polarity.....	Switchable

Options Table

Code	Description
/104.....	100µA current range with resolution of 100nA via display and interface
/N24.....	Only ±24Vdc Input. (No ±6Vdc Input)
/NHQxxN.....	Output power increased to 30W per channel (only up to 3kV)
/VHQ x0xx-h.....	Output current doubled



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Selection Table

Low Cost Models

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

Different output ranges and application/user specific options are possible. Please contact ET to discuss your requirements.

Technical Data

Ripple & noise.....	50mV _{pp}
Resolution of voltage measurement (Display).....	1V
Resolution of current measurement (Display) (12M, 13M).....	1µA (option 104 = 100nA)
Voltage accuracy (for one year).....	± (0.1% V _o + 1 digit)
Current accuracy (for one year).....	± (0.1% I _o + 1 digit)
Stability (ΔV _o /ΔV _{IN}).....	< 1 x 10 ⁻⁴ x V _{OMAX}
Stability load, no load (ΔV _o).....	< 2 x 10 ⁻⁴ x V _{OMAX}
Temperature coefficient.....	< 1 x 10 ⁻⁴ /K
LCD display.....	4 digit for voltage or current (selectable)
Voltage setting.....	Manual: 10 turn potentiometer interface or via analogue voltage
Ramp speed at (HV On/Off).....	Hardware ramp: 500V/s
INHIBIT.....	Per channel (TTL Low)
Protection.....	Separate current & voltage limit, INHIBIT
Power requirements V _{IN}	±24V (<800mA single ch. <400mA) ±6V (100mA) (option N24 = without 6V)

Options Table

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

The mainframes listed below are designed to house & power the high voltage modules when they are built as Eurocassettes. These rack mounting mainframes simplify system integration with their optional CAN interfaces.

19" Mainframes

Type	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 ±6V	Each 1A	Each 2A	Each 2A	Each 2A	Each 2A	
at ±6V	Each 0.5A	Each 1A	Each 2A	Each 6A	Each 4A	Each 10A