

# NIM 6000 series

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*NIM 6000 series*



**The WIENER NIM 6000 series combines the technical advantages of the VME 6000 high efficient , low noise switching power supplies with the high reliability CERN spec. conform WIENER NIM chassis. The modular concept of WIENER NIM 6000 series crates allows fan trays and power supplies to be easily inserted and removed without tools.**

The NIM connectors of slot 1+2, 4, 6+7, 9, 11+12 feature additional pins for temperature measurement inside inserted NIM modules. These 8 probes, if connected, will be automatically processed by the system monitoring. Two temperature thresholds can be programmed to protect high sophisticated NIM modules. In case the first limit is exceeded the fans turns to maximum speed. When exceeding the second level the power supply will be switched off.

The NIM 6000 series has all features of the WIENER local and remote monitoring and control which includes a web-ready Ethernet communication..

## Main Features

- 19" x 7 U enclosure for 12 NIM modules
- Very rugged steel-aluminum construction features 5mm thick heavy duty side plates with zero-tolerance countersink screw positioning of all horizontal rails, stainless steel card guide rails
- UEL 6020 fan tray equipped with 6 individually controlled long-life DC fans, MTBF >65 000h

- Integrated fan speed and thermal monitoring, adjustable fan speed (1200 ... 3200 RPM)
- Microprocessor controlled with alphanumeric high-visibility LED display for all fan tray, bin and power supply parameters (voltages, currents, power, temperatures, set-up data...)
- built in combo interface (Ethernet, RS232, CAN-bus) for remote monitoring and control
- UEP 6021 high density / lowest-noise power supply in WIENER "Cavity-VHF" switching technology with excellent RF-shielding, < 10mV<sub>pp</sub>
- micro-processor controlled, programmable voltage adjustment, current limits and over-/ under voltage trip off points, temperature limits
- Self protected against any failure as under/over voltage, over current, over temperature, ...
- 94V – 260V world-wide auto-range AC input, with power factor correction, CE

## UEN06 NIM bin

- 19" x 7 U enclosure for 12 NIM modules
- Very rugged steel-aluminum construction features 5mm thick heavy duty side plates with zero-tolerance countersink screw positioning of all horizontal rails, stainless steel card guide rails
- Dimensions: 19" x 7U x 570mm (620mm with power supply) [whd], weight: ca. 12 Kg

## UEL 6020 Fan Tray

- Designed to provide superior cooling of NIM modules in bottom-to-top air flow
- Equipped with 6 individually controlled long-life DC fans, MTBF >65 000h
- Integrated fan speed and thermal monitoring, adjustable fan speed (1200 ... 3200 RPM)
- Microprocessor controlled with alphanumeric high-visibility LED display for all fan tray, bin and power supply parameters (voltages, currents, power, temperatures, set-up data...)
- built in combo interface (Ethernet, RS232, CAN-bus) for remote monitoring and control
- Dimensions: 430mm x 2U (89mm) x 340mm [whd], weight: ca. 5.4 Kg

## UEP 6021 Power Supply

- High density / lowest-noise power supply in WIENER "Cavity-VHF" switching technology with excellent RF-shielding, < 10mV<sub>pp</sub>
- Modular and expandable design with self-ventilated universal power blocks, individually sensed and floating DC outputs
- micro-processor controlled, programmable voltage adjustment, current limits and over-/ under voltage trip off points, temperature limits
- Self protected against any failure as under/over voltage, over current, over temperature, ...
- 94V – 260V world-wide auto-range AC input, with power factor correction, CE
- High power density, up to 3 kW DC output power,
- Dimensions: 430mm x 3U (133mm) x 250mm [whd], weight: 12,5kg (with +/-6V/90A max, +/-12V/23A max, +/-24V/11,5A max output)

### Standard Crate configurations (other possible on request)

Crate Version	Slots	+6V/-6V	+12V/-12V	+24V/-24V	115VAC	Power
NIM 6021-1400	12	30A	23A	11.5A	-	1464W
NIM 601-2000	12	90A	23A	11.5A	-	2184W
NIM 6021-2700S	12	90A	46A	11.5A	-	2736W
NIM 6021-2700	12	90A	23A	23A	-	2736W

## UEL6020 Fan Tray

### Fan trays UEL 6020 / Control & Interface

The UEL6020 is the plug in fan and control unit for all crates of the 6000 family. Matching the crate card cage size fan trays are available in 160mm, 220mm, 340mm, 400mm and 600mm depth. In addition to providing a cooling airflow through the front card cage optionally rear side transition board cooling is possible.

All UEL 6020 fan trays are outfitted with long life individually controlled DC fans for bottom to top air flow operation. Depending on the required air flow and crate size either “standard” or “super blower” fans are used.

All fan trays (except the 6U / 160mm fan tray for frontal entry) are equipped with a topped plenum pressure chamber, 25mm high, for optimized air flow homogenization through all slots as well as for mixed module depths.

UEL 6020 fan trays have a built-in microprocessor for fan control, communication with the power supply and display / networking. Default version is the EX type which has a high visibility alphanumeric display and combo interface (Ethernet, CAN-bus, RS232) for remote monitoring and control. This interface allows the crate, including power supply, fan tray and bin temperature sensors, to be controlled and monitored remotely using either Ethernet or CAN-bus.

A built in web server allows the crate health to be monitored via a web browser on a PC attached to the appropriate network, while SNMP provides a convenient way to tailor a control system to a given application. All network connectors are RJ45 type.

	<b>Standard 118mmx118mm</b>	<b>Super Blower 150mm</b>	<b>HRPM 118mm x 118mm</b>
<b>Static pressure at 3000 RPM:</b>	8 mm H <sub>2</sub> O column	14 mm H <sub>2</sub> O column	28 mm H <sub>2</sub> O column
<b>Max. Speed of Rotation:</b>	>3000 RPM	>3000 RPM	>6000 RPM
<b>Power Consumption</b>	6-8W typical	12-15W Typical	20W
<b>Start up Current:</b>	Limited by soft start circuit		
<b>Operating Voltage:</b>	Fan tray 30VDC, internal Blowers 0-24VDC,		
<b>Optimum operating range:</b>	2- 3,8mm H <sub>2</sub> O	4- 5,5mm H <sub>2</sub> O	10- 15mm H <sub>2</sub> O
<b>Operating Temperature:</b>	0... 70°C		
<b>MFOT (Maintenance Free Operation Time)</b>	>65 000 h at 40°C ambient, > 85 000 h at 25°C ambient		

**Variable fan speed** is manually or remotely selectable from 1200 to >3000rpm. In case optional bin temperature probes are installed the fan can run in temperature-controlled mode. Running with lower fan speed all temperatures are monitored. Exceeding the first limit (user defined, default 45°C) all fans run with maximum speed in order to provide full cooling. In case the temperature passes the second limit the power supply switches off.

Adjustable “after-running” of fans guarantees further cooling after power off.

The intelligent EX- fan trays are prepared for **hot swapping**.

**Front panel outfitted with 4 status LED** showing:

<b>Status</b>	Green:	all values inside tolerance
<b>Fan fail</b>	Yellow:	one or more fans fail
<b>Overheat</b>	Yellow:	power supply overheated
<b>Sys fail</b>	Red:	VMEbus generates sysfail

A manual SysRest button on the front panel is recessed to avoid it being pressed accidentally.

All EX- fan tray monitoring can be set to Programming Mode. This feature allows all key functions and values of the power supply, like current limits and other trip off points, to be programmed. The programming can be done either locally via the front panel, or remotely via the Ethernet or CANbus interface.

## UEP 6021 Power Supplies

High density, highly sophisticated modular power supplies designed with WIENER's "Low-Noise-Cavity-VHF-switching technology" which features **extremely low ripple and noise** (PARD) figures. This technology prevents uncontrolled RF emissions by proper internal shielding and containing of switching parts as well as an efficient deflection of magnetically induced RF currents. A well-balanced thermal design secures excellent long term stability and high MTBF.

Up to eight independent regulated DC outputs. For higher current capability, power modules can work in parallel. All **outputs are floating**. Therefore common- or separated grounds can be realized at backplane level (for example analog- and digital- grounds isolated). Wide compatibility ranges become possible by automatic programming of voltage levels and current limits to reference-values that are stored in a bin-memory (Power Protection Memory, PPM system). Incompatibility between bin/backplane and power supply prompts the PPM to keep the power supply off.

Two types of power boxes are available: **3U box** with 92-265VAC input for 1kW-3kW DC-output. **6U boxes** offer space for a second A/C mains input (PFC) to utilize up to 6kW DC performance (230VAC mains input!). Power boxes include:

- Mains filter in connection with a power factor corrected mains input module (PFC) and soft start circuit,
- auxiliary power supply to provide monitoring and control logic as well as provide power for the fan tray,
- Monitoring and alarm circuit supported by a self-calibrating microprocessor system.
- Five, six (3U box) or 10 slots (6U box) for power modules (DC-to-DC converters)
- CAN-bus interface, processing all power supply, fan tray, and bin data
- Power modules and mains inputs are equipped with long life cooling fans.

Serial connections between power supply, fan tray and bin (plug & play) allows communication and exchange of data between all crate.

<b>Rated mains input range</b>	106- 230VAC ± 15% (90...265VAC)
<b>Rated input current</b>	Sinusoidal 16A for suffix H input, 32A for suffix K input
<b>Inrush current:</b>	limited to rated input current (cold unit)
<b>Input fuse:</b>	external, intern on special request
<b>Isolation (Inp.- outp.)</b>	CE EN 60950, ISO 380, VDE 0805, UL 1950, C22.2.950
<b>DC output power:</b>	<b>H</b> for 1000... <3000W (92 ...265VAC) <b>K</b> for 2000... <6000W (92 ...265VAC)

**H** input outfitted with removable power cord (3\*1,5mm<sup>2</sup>) for 16A nominal input current,  
**K** input (6U power box) is equipped with 2m fixed power cord for up to 32A nominal.

**Regulation**

<b>Regulation static:</b>	MEH 550W/650W	<15mV	(+/-100% load, +/- full mains range)
	MDH (20A):	<0,05%	(+/-100% load, +/- full mains range)
	MDL / MDH	<0,1%	(+/-100% load, +/- full mains range)
<b>Regulation dynamic:</b>	MEH, MDH	<100mV	(+/-25% load)
	MDL / MDH	<0,7%	(+/-25% load)
<b>Recovery time</b>	+/-25% load:		within +-1%    within +-0,1%
	Modules 550W	0,2ms	0,5ms,
	Modules 650W	0,5ms	1,0ms
	MDL / MDH	0,0ms	1,0ms

(Conditions: Current slope  $\leq 1000\text{A/ms}$ , 21mF per 100A  $\triangleq$  1mF per slot)

**Sense**

**compensation range:** difference between min. and max. output voltage

**Available modules**

Type	Channels	Voltage range	Peak output / power	Noise and ripple
MEH	1	<b>2... 7,0V</b>	115A / 550W	10mVpp, (0-20MHz), <2mVrms (0-30MHz)
MEH	1	<b>7...16V</b>	46A / 550W	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)
MEH	1	<b>12...30V</b>	23A / 550W	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)
MEH	1	<b>30...60V</b>	13,5A / 650W	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)
MDH	2	<b>2...7,0V</b>	(+/-) 30A / 210W (420W)	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)
MDH	2	<b>7...16V</b>	(+/-) 20A / 250W (500W)	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)
MDL	2	<b>7...24V</b>	(+/-) 11,5A / 275W. (550W)	<15mVpp, (0-20MHz), <2mVrms (0-30MHz)

**EMC Compatibility**

EMA.	EN 61 000-6-3:2001	[RF emission]
	EN 55 022:1998 + Corr:2001 + A1:2000 Class B	conducted noise
	EN 55 022:1998+ Corr:2001 + A1:2000 Class B	radiated noise
	EN 61 000-3-2:2001	harmonics

EN 61 000-3-3:1995 +Corr:1997 +A1:2001

flicker

<b>EMB</b>	<b>EN 61 000-6-2:2001</b>	<b>[immunity]</b>
	EN 61 000-4-6:1996 + A1:2001	injected HF currents
	EN 61 000-4-3:1996 + A1:1998 + A2:2001	radiated HF fields incl. "900MHz"
	EN 61 000-4-4:1995 + A1:2001	Burst
	EN 61 000-4-5:1995 + A1:2001	Surge
	EN 61 000-4-11:1994 + A1:2000	voltage variations
	EN 61 000-4-2:1995 + A1:1998 + A2:2001	ESD

**Operation temperature:** 0... 50°C ambient without derating, Storage:-30°C ... +85°C

**Temperature coefficient:** < 0,2% / 10K

**Stability:** 10mV or 0,1% / 24 hours, 25mV or 0,3% / 6 month (under constant conditions)

**Current limits:** adjustable to any lower level

**Voltage rise characteristics:** monotonic 50ms, processor controlled.

**Overvoltage protection:** crow bar protection trip off adjusted to 125% of nominal voltage each output

**DC Off (trip off):** within 5ms if >5% deviation from adjusted nominal values, after overload, overheat, overvoltage, undervoltage (bad status), and fan fail, if temperatures exceed 125°C at heat sinks  
Limits programmable. Outputs discharged by crow bars, when power supply tripped- or switched Off.

**Efficiency:** 75% ... 85%, depends on used modules

**M F O T** (Maintenance Free Operation Time):

*internal blowers:* 40°C ambient >65 000 h

25°C ambient 100 000 h

*electronics:* 40°C ambient >100 000 h

*Water cooled power supplies:* 40°C water >100 000 h

## UEN 06 NIM bin

7U NIM-Bin for 12 high powered NIM-Modules, rugged heavy-duty construction with 6mm side panels depth 525mm. Power supply is plugged in and locked from rear side. The bin provides 2U space for a fan tray unit. The power-bus-system is equipped with 12 high-quality long-life NIM connectors parallel wired. Connector pins made of massive brass, gold plated.

Based on the 6000 series design the UEN 06 NIM bin has a 2U high fan tray space below the 5U NIM module cage. The power supply is plugged into the rear.

## Dimensions of UEN 06

19" (483mm) x 7U (331mm) x 570mm (620mm with inserted power supply) [whd]

### Current maximum ratings:

Voltage Line	Current / slot	Current / bin	Comment
+/-6V	13A	90A	sensed
+/-12V	13A	46A	sensed
+/-24V	13A	23A	sensed
GND	13A		
115V AC	-	-	Secondary

All NIM bins have clean earth wired with 0,25mm<sup>2</sup>

### Product Data Sheet

NIM 6000 series: [Print Product Data Sheet](#)

### Documentation

Manual: [Manual NIM-CAMAC](#)

[RemoteControl](#)

Introduction: [WIENER NIM CAMAC introduction](#)

### Downloads

SYScontrol : [Download](#)

SNMP: [Download](#)

OPC-Server: [Download](#)

UEP6Control: [Download](#)

Firmware UEL: [UEL6](#)

[UEL6-Ethernet](#)

Firmware UEP : [Download](#)