TAVAN PAJOOHAN FANAVAR PASARGAD

شرکت تـوان پـژوهان فناور پاسارگاد ، تهـران، کیـلومتر۲۰
جـاده دمـاونـد، پـارک فن آوری پـردیـس ، خیـابـان نـوآوری ۱۲،
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PROGRAMMABLE DC POWER SUPPLY

It's all about Integrity, Experience and Innovation

درباره ما

شرکت مهندسی توان پژوهان فناور پاسارگاد (با نام قبلی کاوندیش سیستم) فعالیت خود را از سال ۱۳۷۶ در زمینه ی طراحی و تولید انواع مبدل های قدرت آغاز نمود.
نگاه راه حلّی به موضوع منابع تغذیه، سبب شد تا این شرکتِ دانش بنیان از همان ابتدای کار، به عنوان یک شرکتِ "طراح برای

درک عمیق از استاندارد های فنی محصول و استانداردهای مدیریت کیفیت (ISO)، همراه با بکارگیری افراد بسیار توانمند و نخبه ی کشور سبب شد تا فرآیند ایده تا محصول در پروژه های بسیار زیادی با موفقیت طی گردد و کارنامه ی درخشان را از خود برجای گذارد.
از سال ۱۳۸۴، علاوه بر پروژه های Custom Design، طراحی و تولید منابع تغذیه DC توان بالا و قابل برنامه ریزی نیز که از جمله منابع تغذیه ی استاندارد و در عین حال High Tech محسوب می شوند در دستور کار این شرکت قرار گرفت و اکنون با افتخار نسل سوم به صنایع کشور معرفی می گردد.
هدفِ ما توسعه محصولات استاندارد در خصوص منابع تغذیه است، امّا همچنان از "طراحی براساس نیاز مشتری" (Custom Design) استقبال می نمائیم. لطفاً توانایی ما را امتحان کنید.

Design: P. J.

کاربردها:

- آزمایشگاه های تحقیقاتی
- آزمایشگاه های تست قطعه
- تجهیزات تست اتوماتیک
- صنایع اتومبیل سازی برق
- صنایع هوا-فضا
- صنایع نیمه هادی
- صنایع مخابرات
- صنایع لیزر
- صنایع آبکاری دقیق
- تجهیزات پزشکی
- شبیه ساز باتری
- شبیه ساز سلول های خورشیدی

Programmable DC Power Supply

NiKA *Family*

NiLA *Family/Current Source*

NiKA Family
Programmable DC Power Supply

منابع تغذیه DC قابل برنامه ریزی خانواده NiKA با بهره گیری از جدیدترین فناوری ها در حوزه ی الکترونیک قدرت و الکترونیک دیجیتال، مشخصات فنی بسیار عالی و منحصر به فردی را به خود اختصاص داده است.

خانواده NiKA در مقایسه با محصولات مشابه دیگر سازندگان مطرح دنیا، امتیازات فنی بارزی دارد که مجموع این امتیازات، به طور همزمان در هیچ یک از آن محصولات یافت نمی شود و به همین دلیل این محصول را نسبت به سایر برندها کاملاً متمایز و شاخص می سازد.

برنامه ریزی و مانیتورینگ در منابع تغذیه DC خانواده NiKA هم از طریق پانل جلوی دستگاه که پانلی منحصر به فرد، پیشرفته، دقیق با سهولت کاربری است، امکان پذیر می باشد و هم از طریق پورت آنالوگ و یا انواع پورت های دیجیتال GPIB/RS485 , RS232/RS485/USB , LAN/RS485 قابل انجام است.

در هر یک از کارت های دیجیتال فوق، دو پورت RS485 به صورت ورودی و خروجی تعبیه شده است که جهت اتصال زنجیروار چندین دستگاه در ارتباط دیتا بکار گرفته می شوند.

پیاده سازی مجموعه فرامین استاندارد SCPI در خانواده NiKA، امکان برنامه ریزی و مانیتورینگ را در محیط های متنوع برنامه نویسی فراهم می کند.

Features

- High reliability
- High resolution
- High accuracy
- Excellent line & load regulation
- Short rise-time and fall-time
- Extremely low ripple & noise
- High stability
- High power density
- Optional over-power capability up to 150% for 4 seconds
- High efficiency
- Zero voltage soft switching
- Wide input voltage range
- High power factor (Active PFC)
- Constant Voltage, Constant Current and Constant Power operation modes
- Simple front panel operation despite the versatile functionalities
- Parallel and series operation
- Analog programming and monitoring
- Optional isolated analog I/O
- Optional Serial, GPIB or Ethernet interfaces
- Fast programmable over voltage protection
- Over current protection
- Over temperature protection
- Under voltage lock-out protection for sensitive loads

NiKA2000 1U, 2000W

Output Rating	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
	Rated Output Current	A	125	80	57.2	50	33.3	25	20	13.3	10	6.67
	Rated Output Power	W	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

NiKA3000 1U, 3000W

Output Rating	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
	Rated Output Current	A	150	120	85.7	75	50	37.5	30	20	15	10
	Rated Output Power	W	2400	3000	3000	3000	3000	3000	3000	3000	3000	3000

NiKA4500 2U, 4500W

Output Rating	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
	Rated Output Current	A	200	180	128.6	112.5	75	56.3	45	30	22.5	15
	Rated Output Power	W	3200	4500	4500	4500	4500	4500	4500	4500	4500	4500

NiKA6000 2U, 6000W

Output Rating	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
	Rated Output Current	A	200	200	171.4	150	100	75	60	40	30	20
	Rated Output Power	W	3200	5000	6000	6000	6000	6000	6000	6000	6000	6000

Ordering Code:

Example: NiKA4500 – 60 – 1EU – S

Series Name:	Rated Output Voltage:		Input Voltage:	Remote Control:	Others:
NiKA2000	16	80	1EU: 230VAC/1Ph	S : Serial	T: Wide Operating Temperature -20 ~50 °C
NiKA3000	25	100	3EU: 400VAC/3Ph	G :GPIB	-: None
NiKA4500	35	150	1US: 120VAC/1Ph	E : Ethernet	
NiKA6000	40	200	3US: 208VAC/3Ph	IA : Isolated Analog	
	60	300		-: None	

Front Panel Description

1. Power Switch: AC input ON/OFF control ("1" indicating ON and "0" indicating OFF).
2. 4 digit 7 segment LED display, mainly for indicating Output Voltage. Output Power (Refer to 18), menu items (Refer to 14), adjusted voltage (Refer to 12), adjusted power limit and fault type are also displayed by this indicator.
3. 4 digit 7 segment LED display, mainly for indicating Output Current. Output Power (Refer to 18), value of menu items (Refer to 14), adjusted current limit (Refer to 13) and adjusted power limit are also displayed by this indicator.
4. Green LED, when On: adjacent display (2) is indicating the output voltage in volts, when blinking: adjacent display (2) is indicating the adjusted voltage in volts.
5. Green LED, when On: adjacent display (2) is indicating the output power in watts, when blinking: adjacent display (2) is indicating the adjusted power limit in watts.
6. Green LED, when On: adjacent display (3) is indicating the output current in amperes, when blinking: adjacent display (3) is indicating the adjusted current limit in amperes.
7. Green LED, when On: adjacent display (3) is indicating the output Power in watts, when blinking: adjacent display (3) is indicating the adjusted power limit in watts.
8. Green LED, when On: indicating Constant Voltage (CV) mode.
9. Yellow LED, when On: indicating Constant Power (CP) mode.
10. Yellow LED, when On: indicating Constant Current (CC) mode.
11. Red LED, when On or blinking: indicating Fault occurrence.
12. Press-able high resolution rotary encoder knob for setting output voltage or output power limit and selecting menu items.
13. Press-able high resolution rotary encoder knob for setting output current limit or output power limit and adjusting value of menu items.
14. Menu button.
15. Key Green LED, when On: indicates that the menu mode is active.
16. Fine setting button, Lock/Unlock button by pressing and holding it more than 3 seconds.
17. Key Green LED, when On: indicates that fine setting is enabled.
18. Display button: Switches the values shown in the 7 segment displays (2, 3) between 3 different modes: Voltage-Current, Power-Current and Voltage-Power.
19. Out ON button: DC Output ON/OFF control.
20. Key Green LED, when On: indicates that the output DC is turned on.

Serial Interface containing RS232/RS485 and USB Connections.

GPIB Interface containing RS485 and GPIB Connections.

Ethernet Interface containing RS485 and Ethernet Connections.

Rear Panel Description

1. AC Input Connector (single phase or three phase).
2. DC Output Connector:
   - Bus-bars for models with output currents greater than 42A.
   - Wire screw Connector for models with a maximum current of up to 42A.
3. Remote Sense Connector.
4. 4 Positions DIP-Switch for device setup.
5. Analog Programming and Monitoring Connector (25-pin D-Type connector).

Optional Remote Programming Interfaces:

6. Serial Interface, containing RS232/RS485 and USB Connections.
7. GPIB Interface, containing RS485 and GPIB Connections.
8. Ethernet Interface, containing RS485 and Ethernet Connections.

Items of Remote Programming Interfaces:

9. RS232/RS485 Input Port.
10. RS485 Input Port.
11. Output RS485 port for chain connection to other power supplies.
12. USB Connector.
13. GPIB Connector.
14. Ethernet Connector.

NiKA Technical Specifications

	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
Input Characteristics	Input Voltage/Freq. [i]	---	171~265VAC continuous, 47~63Hz, Single phase (nominal: 230VAC) for NiKA2000, NiKA3000 & NiKA4500 Models. 325~440VAC continuous, 47~63Hz, Three phase (nominal: 400VAC) for NiKA6000 Models.									
	Input Current (at nominal input)	A	≤10.5 for NiKA2000, ≤15.5 for NiKA3000 Models. ≤23 for NiKA4500, ≤10 for NiKA6000 Models.									
	Power Factor (Active PFC)	---	≥0.998 (at 230VAC & Full load) for NiKA2000, NiKA3000 & NiKA4500 Models. ≥0.95 (at 400VAC & Full load) for NiKA6000 Models.									
	Efficiency (at 230VAC & Full load) for NiKA2000	%	84	85	87	87	88	88	89	89	89	90
	Efficiency (at 230VAC & Full load) for NiKA3000	%	86	86	88	89	89	89	90	90	90	91
	Efficiency (at 230VAC & Full load) for NiKA4500	%	88	88	89	89	90	90	91	91	91	92
	Efficiency (at 400VAC & Full load) for NiKA6000	%	89	90	91	91	92	92	93	93	93	94
	Inrush Current (at nominal input)	A	≤20 for NiKA2000, ≤30 for NiKA3000 Models. ≤40 for NiKA4500, ≤20 for NiKA6000 Models.									
	Total Harmonic Distortion (THD)	%	<4 (at 230VAC & Full load) for NiKA2000, NiKA3000 & NiKA4500 Models. 30% typ. (at 400VAC & Full load) for NiKA6000 Models.									
	Hold-up Time	ms	10 for NiKA2000, 10 for NiKA3000 Models. 15 for NiKA4500, 10 for NiKA6000 Models.									
Constant Voltage Mode	Max. Line Regulation [ii]	---	0.005% of Full scale									
	Max. Load Regulation [iii]	---	0.01% of Full scale									
	Ripple and Noise [iv] (P-P, 20MHz)	mV	32	40	40	50	60	60	80	80	100	100
	Ripple RMS, 5Hz~1MHz	mV	2	4	5	5	6	8	10	15	20	25
	Max. Remote Sense Compensation	---	Any voltage drop compensation while voltage at output terminals does not exceed 105% of output rated voltage and output power does not exceed its rated value.									
	Warm-up [v]	---	0.01% of full scale+2mV									
	Stability [vi]	---	0.01% of full scale+2mV									
	Temperature Coefficient [vii]	ppm/°C	50									
	Output Voltage Rise-time [viii]	ms	15									
	Output Voltage Fall-time [ix] (Full load)	ms	10									
	Output Voltage Fall-time [ix] (No load)	ms	50	50	50	50	50	50	120	120	200	250
	Load Transient Response [x]	ms	1									

	Rated Output Voltage	V	16	25	35	40	60	80	100	150	200	300
Constant Current Mode	Max. Line Regulation [xi]	---	0.01% of Full scale									
	Max. Load Regulation [xi]	---	0.01% of Full scale									
	Ripple RMS, 5Hz~1MHz for NiKA2000	mA	250	160	115	100	67	50	40	27	20	14
	Ripple RMS, 5Hz~1MHz for NiKA3000	mA	300	240	170	150	100	75	60	40	30	20
	Ripple RMS, 5Hz~1MHz for NiKA4500	mA	400	360	250	225	150	110	90	60	45	30
	Ripple RMS, 5Hz~1MHz for NiKA6000	mA	35	35	35	30	25	15	12	8	8	8
	Warm-up [v]	---	0.5% of full scale									
	Stability [vi]	---	0.05% of full scale									
	Temperature Coefficient [vii]	ppm/°C	100									
	Output Current Rise-time [viii]	ms	20									
	Output Current Fall-time [ix]	ms	10									
Constant Power Mode	Max. Line Regulation [xi]	---	0.02% of Full scale									
	Max. Load Regulation [xiii]	---	0.02% of Full scale									
	Stability	---	0.1% of full scale									
Physical	Weight	Kg	~9 Kg for NiKA2000 & NiKA3000 ~16 Kg for NiKA4500 & NiKA6000									
	Dimensions (W×H×D) [xiv]	mm	444×44×475 (±1mm) for NiKA2000 & NiKA3000 Models. 444×88×475 (±1mm) for NiKA4500 & NiKA6000 Models.									
	Input Connector	---	Phoenix Contact screw plug connector, P/N: 1777846 for NiKA2000, NiKA3000 & NiKA4500 Models. Phoenix Contact screw plug connector, P/N: 1777859 for NiKA6000 Models.									
	Output Connector	---	Bus-bars for high current models with rated output current greater than 42A and Phoenix Contact screw plug connector (P/N: 1969454) for low current models with rated output current smaller than 42A.									

All specifications are subject to change without notice.

i Optional 3 phase models with 171~265VAC input voltage range (nominal: 208VAC) are available upon request.
ii Over the specified input voltage range and for constant load using Remote Sense Connection.
iii From no load to full load, using Remote Sense Connection, at nominal input.
iv Measured with a 1:1 oscilloscope probe and with a 100nF capacitor across the probe's coaxial cable.
v Over 30 minutes operation at full load after power on.
vi Measured over 8 hours following 30 minutes of warm-up.
vii Following 30 minutes of warm-up.
viii Measured from 10% to 90% of rated value, following run.
ix Measured from 90% to 10% of rated value, following stop.
x Time for output voltage to recover within 0.5% of rated output voltage following a 25% to 75% or a 75% to 25% load current change while the output voltage is set to any voltage in range of 10% to 100% of rated value and without Remote Sense Connection.
xi Over the specified input voltage range and for 95% of rated load.
xii From 5% to 95% of rated load at nominal input voltage.
xiii For 50% of rated output power, by changing the value of connected resistive load.
xiv The dimensions are just for the case, not containing L-brackets and terminals.

NiKA General Specifications

	Rated Output Voltage (V)	16	25	35	40	60	80	100	150	200	300
Power Supply Extension	Parallel Operation	Up to 4 units with the same rated Output Voltage in the master/slave mode.									
	Series Operation	Up to 2 units with external diodes. (Consideration about the maximum floating voltage must be taken into account.)									
Analog Programming and Monitoring	Vout Voltage Programming[i]	0–5V or 0–10V Selectable by DIP switch, accuracy and linearity: ±1%.									
	Iout Voltage Programming[i]	0–5V or 0–10V Selectable by DIP switch, accuracy and linearity[ii]: ±1%.									
	Vout Resistive Programming	0–5KΩ or 0–10KΩ Selectable by DIP switch, accuracy and linearity: ±2%.									
	Iout Resistive Programming	0–5KΩ or 0–10KΩ Selectable by DIP switch, accuracy and linearity[ii]: ±2%.									
	Voltage or Resistive Programming	Dry contact, open contact: voltage programming mode and short contact: resistive programming mode.									
	Output Voltage Monitoring[iii]	Electrical voltage: 0–5V or 0–10V, Selectable by DIP switch.									
	Output Current Monitoring[iii]	Electrical voltage: 0–5V or 0–10V, Selectable by DIP switch.									
	Power Supply OK Signal	Indicates power supply status by electrical voltage, 4V–5V: Run and 0V–1V: Stop.									
	Constant Current Mode Indicator (CC)	Open collector, CV or CP mode: open and CC mode: short. Maximum applicable voltage is 40V and maximum sinking current is 10mA.									
	Constant Power Mode Indicator (CP)	Open collector, CV or CC mode: open and CP mode: short. Maximum applicable voltage is 40V and maximum sinking current is 10mA.									
	Shut Down Control	Electrical voltage 0–0.5V/2–10V or Dry contact, OFF: 0–0.5V or short contact & ON: 2–10V or open contact.									
	Enable/Disable[iv]	Dry contact, Open: Disabled and Short: Enabled.									
	Output Voltage Local/Remote Analog Control	Electrical voltage 0–0.5V/2–10V or Dry contact, 0–0.5V or short contact: Remote, 2–10V or Open: Local.									
	Output Current Limit Local/Remote Analog Control	Electrical voltage 0–0.5V/2–10V or Dry contact, 0–0.5V or short contact: Remote, 2–10V or Open: Local.									
	Isolated Analog Programming and Monitoring Port	Optional									
Front Panel	Voltage Monitoring Accuracy	0.05% of rated Output Voltage.									
	Voltage Monitoring Resolution (mV)	10	10	10	10	10	10	100	100	100	100
	Voltage Programming Accuracy	0.01% of rated Output Voltage.									
	Voltage Programming Resolution (mV)	10	10	10	10	10	10	100	100	100	100
	Current Monitoring Accuracy	0.5% of rated Output Current.									
	Current Monitoring Resolution	4 digit									
	Current Programming Accuracy	0.5% of rated Output Current.									
	Current Programming Resolution	4 digit									
	Power Monitoring Accuracy	0.5% of rated Output Power.									
	Power Monitoring Resolution	1W									
	Power Programming Accuracy	0.5% of rated Output Power.									
	Power Programming Resolution	1W									
Remote Controlling by Standard Interfaces	Optional Interfaces	Serial Interface Card, GPIB Interface Card or Ethernet Interface Card.									
	Serial Interface Card Connections	RS232/RS485 input port for PC connection, RS485 output port for chain connection to other power supplies and USB connection.									
	GPIB Interface Card Connections	GPIB connection, RS485 input port for PC connection and RS485 output port for chain connection to other power supplies.									
	Ethernet Interface Card Connections	Ethernet connection, RS485 input port for PC connection and RS485 output port for chain connection to other power supplies.									
	Voltage Monitoring Accuracy	0.01% of rated Output Voltage.									
	Voltage Monitoring Resolution	0.002% of rated Output Voltage.									
	Voltage Programming Accuracy	0.01% of rated Output Voltage.									
	Voltage Programming Resolution	0.002% of rated Output Voltage.									
	Current Monitoring Accuracy	0.5% of rated Output Current.									
	Current Monitoring Resolution	0.003% of rated Output Current.									
	Current Programming Accuracy	0.5% of rated Output Current.									
	Current Programming Resolution	0.003% of rated Output Current.									
	Power Programming and Monitoring Accuracy/Resolution	Similar to the Front Panel Power Programming and Power Monitoring specifications.									

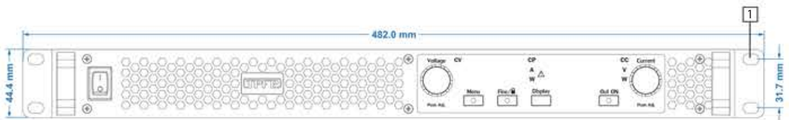
	Rated Output Voltage (V)	16	25	35	40	60	80	100	150	200	300
Protective Functions		Fast operation by hardware. Over-Voltage limit is adjustable. Manual reset would be needed.									
	Over-Voltage Protection Limit Range (V)	17	27	37	43	64	85	107	160	215	320
	Output Under-Voltage Lock-Out Protection	Under Voltage limit is adjustable. Manual reset would be needed. This option also prevents the user from adjusting Output Voltage below 105% of UVLO level.									
	Output Over-Current Protection	Enabling this feature in the front panel menu or from remote interfaces prevents the power supply from operation in Constant Current mode when the Output Current reaches the adjusted Current Limit and the output shuts down and manual reset would be needed.									
	Over Temperature Protection	Automatic operation after over temperature removal.									
	AC Input Over-Voltage/Under-Voltage Protection	Automatic operation after AC input Over-Voltage/Under-Voltage removal.									
	Fan Malfunction or Disability	Automatic operation after removal of the malfunction.									
Environmental Conditions	Operating Temperature[v]	0–50°C, rated Output Power.									
	Storage Temperature	-25–70°C.									
	Humidity	Up to 95% RH (no condensation) at 0–50°C.									
	Altitude	Maximum 3000m. Derate Output Current by 3%/100m at altitudes above 2000m.									
	Cooling	Forced air cooling by variable speed internal fans, air flow: from front to rear, units can be stacked without any space.									
EMC	**Public low voltage limitations:**										
	IEC/EN 61000-3-2:2009	Limits for harmonic current emission.									
	IEC/EN 61000-3-2:2013	Limitations of voltage changes, voltage fluctuations and flicker emission.									
	Emissions:										
	CISPR11:2009 (EN 55022)	Conducted emission on AC lines class A (150KHz–30MHz).									
	CISPR11:2009 (EN 55022)	Radiated emission on AC lines class A (30MHz–1000MHz).									
	Immunity:										
	IEC/EN 61000-4-2:2008	Immunity to electrostatic discharge.									
	IEC/EN 61000-4-3:2010	Immunity to Radiated electromagnetic fields									
	IEC/EN 61000-4-4:2012	Immunity to electrical fast transient/burst.									
	IEC/EN 61000-4-5:2005	Immunity to surge.									
	IEC/EN 61000-4-6:2013	Immunity to conducted disturbances.									
	IEC/EN 61000-4-8:2009	Immunity to power frequency magnetic field.									
	IEC/EN 61000-4-11:2004	Immunity to voltage dips, short interruptions and voltage variations.									
Safety	Applied Standard	IEC 60950-1:2013-5									
	Classification of Connectors and Terminals	• Output terminals, Remote Sense Connections and non-isolated part of Analog Program Connector are SELV in models with Vouts≤35V while the output voltage is not floated more than 16V from ground potential and are hazardous in other conditions and other models. • Isolated part of Analog Program Connector and Remote Programming Interfaces are SELV in all models.									
	Withstand Voltages (for all models)	Input to Output: 4242VDC, 1min. Input to Communication Circuits (SELV): 4242VDC, 1min. Input to Ground: 2828VDC, 1min. Output to Ground: 2687VDC, 1min. Output to Communication Circuits(SELV): 4242VDC, 1min.									

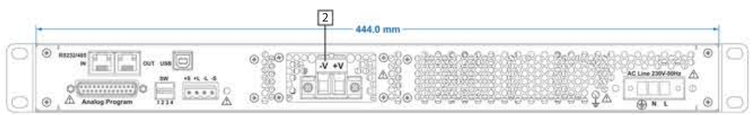
All specifications are subject to change without notice.

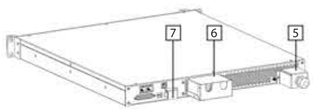
[i] Minimum programming Voltage or Current is guaranteed to maximum 1% of the rated value.
[ii] Accuracy and linearity in the Constant Current Mode is specified without concerning warm-up of the power supply.
[iii] Minimum monitoring Voltage or Current is guaranteed to maximum 1% of the rated value.
[iv] This feature can be deactivated from the front panel to avoid additional wiring at the Analog Program port in normal operation.
[v] Models with extended operating temperature range are available upon request.

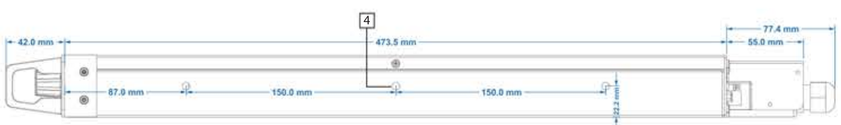
OUTLINE DRAWING

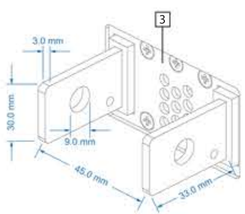
1. Mounting holes for fixing the power supply to the standard 19-inch rack, use M6 screws.
2. Wire screw terminals for low current models.
3. Bus-bars for high current models.
4. Chassis mounting holes, use M4 screws with proper length to avoid entering of screws into the unit more than 5mm.
5. Safety cover for input AC connector including cable strain relief.
6. Safety cover for output terminals.
7. Safety cover for remote sense connector

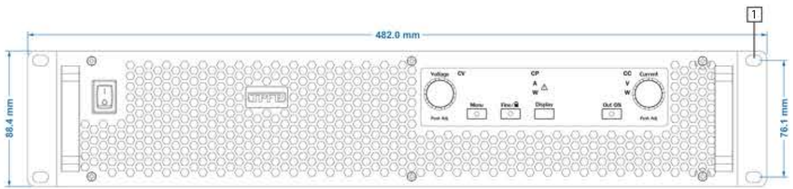


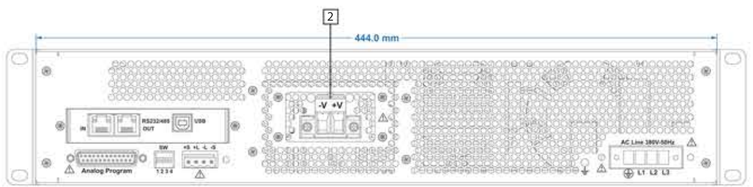


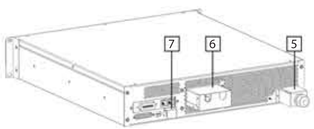


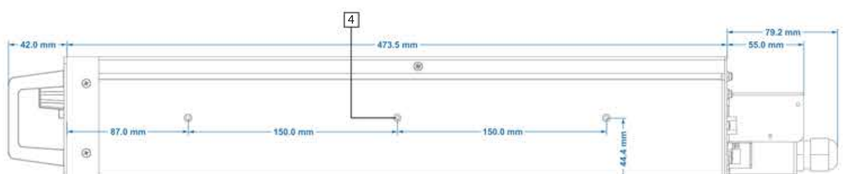


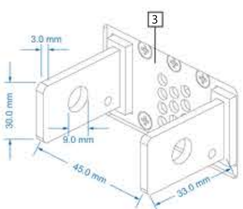












NiLA Family/Current Source
Programmable DC Power Supply

منابع تغذیه ی DC قابل برنامه ریزی خانواده NiLA با مدل های متنوع به لحاظ رنج جریان و ولتاژ و توان، نسل جدیدی از منابع جریان DC توان بالا و قابل برنامه ریزی را ارائه می دهد.

این منابع جریان که خازن خروجی در آن ها کمتر از 10µF است، منابع جریانی بسیار دقیق، مطمئن و پایدار می باشند، ریپل جریان خروجی در آن ها کمتر از 1% است.

منابع جریان خانواده ی NiLA بهترین انتخاب برای درایور لیزرهای نیمه هادی توان بالا است.

برنامه ریزی و مانیتورینگ در منابع تغذیه DC خانواده NiLA هم از طریق پانل جلوی دستگاه که پانلی منحصر به فرد، پیشرفته، دقیق با سهولت کاربری است، امکان پذیر می باشد و هم از طریق پورت آنالوگ و یا انواع پورت های دیجیتال GPIB/RS485 , RS232/RS485/USB , LAN/RS485 قابل انجام است.

در هر یک از کارت های دیجیتال فوق، دو پورت RS485 به صورت ورودی و خروجی تعبیه شده است که جهت اتصال زنجیروار چندین دستگاه در ارتباط دیتا بکار گرفته می شوند.

پیاده سازی مجموعه فرامین استاندارد SCPI در خانواده NiLA، امکان برنامه ریزی و مانیتورینگ را در محیط های متنوع برنامه نویسی فراهم می کند.

Features

- Ideal DC Current Source with very low output capacitance.
- High resolution
- High accuracy
- Excellent line & load regulation
- Short rise-time and fall-time
- Low current ripple
- High stability
- High power density
- High efficiency
- Zero voltage soft switching
- Wide input voltage range
- High power factor (Active PFC)
- Constant Current and Constant Power operation modes
- Simple front panel operation despite the versatile functionalities
- Excellent control capabilities
- Parallel operation
- Analog programming and monitoring
- Optional isolated analog I/O
- Optional Serial, GPIB or Ethernet interfaces
- Programmable over voltage protection
- Programmable over current protection
- Over temperature protection

NiLA2000 1U, 2000W

Output Rating	Rated Output Current	A	50	33.3	20	13.3	10
	Rated Output Voltage	V	40	60	100	150	200
	Rated Output Power	W	2000	2000	2000	2000	2000

NiLA3000 1U, 3000W

Output Rating	Rated Output Current	A	75	50	30	20	15
	Rated Output Voltage	V	40	60	100	150	200
	Rated Output Power	W	3000	3000	3000	3000	3000

NiLA4500 2U, 4500W

Output Rating	Rated Output Current	A	112.5	75	45	30	22.5
	Rated Output Voltage	V	40	60	100	150	200
	Rated Output Power	W	4500	4500	4500	4500	4500

NiLA6000 2U, 6000W

Output Rating	Rated Output Current	A	150	100	60	40	30
	Rated Output Voltage	V	40	60	100	150	200
	Rated Output Power	W	6000	6000	6000	6000	6000

Ordering Code:

Example: NiLA4500 – 60 – 1EU – S

Series Name:	Rated Output Voltage:	Input Voltage:	Remote Control:	Others:
NiLA2000	40	1EU: 230VAC/1Ph	S : Serial	T: Wide Operating Temperature -20 ~50 °C
NiLA3000	60	3EU: 400VAC/3Ph	G :GPIB	-: None
NiLA4500	100	1US: 120VAC/1Ph	E : Ethernet	
NiLA6000	150	3US: 208VAC/3Ph	IA : Isolated Analog	
	200		-: None	

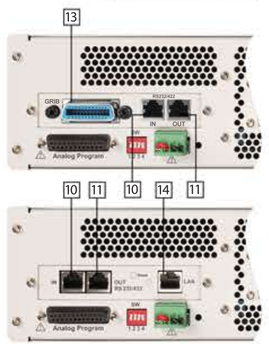
Front Panel Description

1. Power Switch: AC input ON/OFF control ("1" indicating ON and "0" indicating OFF).
2. 4 digit 7segment LED display, mainly for indicating Output Current. Output Power (Refer to 17), menu items (Refer to 13), adjusted current (Refer to 11), adjusted power limit and fault type are also displayed by this indicator.
3. 4 digit 7segment LED display, mainly for indicating Output Voltage. Output Power (Refer to 17), value of menu items (Refer to 13) and adjusted power limit are also displayed by this indicator.
4. Green LED, when On: adjacent display (2) is indicating the output current in amperes, when blinking: adjacent display (2) is indicating the adjusted current in amperes.
5. Green LED, when On: adjacent display (2) is indicating the output power in watts, when blinking: adjacent display (2) is indicating the adjusted power limit in watts.
6. Green LED, when On: adjacent display (3) is indicating the output voltage in volts.
7. Green LED, when On: adjacent display (3) is indicating the output power in watts, when blinking: adjacent display (3) is indicating the adjusted power limit in watts.
8. Green LED, when On: indicating Constant Current (CC) mode.
9. Yellow LED, when On: indicating Constant Power (CP) mode.
10. Red LED, when On or blinking: indicating Fault occurrence.
11. Press-able high resolution rotary encoder knob for setting output current or output power limit and selecting menu items.
12. Press-able high resolution rotary encoder knob for setting output power limit and adjusting value of menu items.
13. Menu button.
14. Key Green LED, when On: indicates that the menu mode is active.
15. Fine setting button, Lock/Unlock button by pressing and holding it more than 3 seconds.
16. Key Green LED, when On: indicates that fine setting is enabled.
17. Display button: Switches the values shown in the 7 segment displays (2, 3) between 3 different modes: Current-Voltage, Current-Power and Power-Voltage.
18. Out ON button: DC Output ON/OFF control.
19. Key Green LED, when On: indicates that the output DC is turned on.

Serial Interface containing RS232/RS485 and USB Connections.

GPIB Interface containing RS485 and GPIB Connections.

Ethernet Interface containing RS485 and Ethernet Connections.



Rear Panel Description

1. AC Input Connector (single phase or three phase).
2. DC Output Connector:
   - Bus-bars for models with output currents greater than 42A.
   - Wire screw Connector for models with a maximum current of up to 42A.
3. Remote Sense Connector.
4. 4 Positions DIP-Switch for device setup.
5. Analog Programming and Monitoring Connector (25-pin D-Type connector).

Optional Remote Programming Interfaces:

6. Serial Interface, containing RS232/RS485 and USB Connections.
7. GPIB Interface, containing RS485 and GPIB Connections.
8. Ethernet Interface, containing RS485 and Ethernet Connections.

Items of Remote Programming Interfaces:

9. RS232/RS485 Input Port.
10. RS485 Input Port.
11. Output RS485 port for chain connection to other power supplies.
12. USB Connector.
13. GPIB Connector.
14. Ethernet Connector.

NiLA Technical Specifications

	Rated Output Voltage	V	40	60	100	150	200
Input Characteristics	Input Voltage/Freq. [i]	---	171~265VAC continuous, 47~63Hz, Single phase (nominal: 230VAC) for NiLA2000, NiLA3000 & NiLA4500 Models. 325~440VAC continuous, 47~63Hz, Three phase (nominal: 400VAC) for NiLA6000 Models.				
	Input Current (at nominal input)	A	≤10.5 for NiLA2000, ≤15.5 for NiLA3000 Models. ≤23 for NiLA4500, ≤10 for NiLA6000 Models.				
	Power Factor (Active PFC)	---	≥0.998 (at 230VAC & Full load) for NiLA2000, NiLA3000 & NiLA4500 Models. ≥0.95 (at 400VAC & Full load) for NiLA6000 Models.				
	Efficiency (at 230VAC & Full load) for NiLA2000	%	87	88	89	89	90
	Efficiency (at 230VAC & Full load) for NiLA3000	%	88	89	90	90	91
	Efficiency (at 230VAC & Full load) for NiLA4500	%	89	90	91	91	92
	Efficiency (at 400VAC & Full load) for NiLA6000	%	91	92	93	93	94
	Inrush Current (at nominal input)	A	≤20 for NiLA2000, ≤30 for NiLA3000 Models. ≤40 for NiLA4500, ≤20 for NiLA6000 Models.				
	Total Harmonic Distortion (THD)	%	<4 (at 230VAC & Full load) for NiLA2000, NiLA3000 & NiLA4500 Models. 30% typ. (at 400VAC & Full load) for NiLA6000 Models.				
	Hold-up Time	ms	10 for NiLA2000, 10 for NiLA3000 Models. 15 for NiLA4500, 10 for NiLA6000 Models.				
Constant Current Mode	Max. Line Regulation [ii]	---	0.01% of Full scale				
	Max. Load Regulation [iii]	---	0.01% of Full scale				
	Ripple (P-P)	---	1% of Full scale				
	Warm-up [iv]	---	0.5% of Full scale				
	Stability [v]	---	0.05% of full scale				
	Temperature Coefficient [vi]	ppm/°C	100				
	Output Current Rise-time [vii]	ms	≤10				
	Output Current Fall-time [viii]	ms	≤10				
	Transient Response [ix]	ms	1				
	Current Overshoot	---	Maximum 5% of full-scale for 0% to 100% output current change and with resistive load.				
	Output Capacitance) for NiLA2000	μF	3.3	1	0.33	0.15	0.12
	Output Capacitance) for NiLA3000	μF	4.7	1.5	0.47	0.27	0.22
	Output Capacitance) for NiLA4500	μF	6.8	2	0.68	0.33	0.27
	Output Capacitance) for NiLA6000	μF	10	2.7	1	0.47	0.33

	Rated Output Voltage	V	40	60	100	150	200
Constant Power Mode	Max. Line Regulation [x]	---	0.02% of Full scale				
	Max. Load Regulation [xi]	---	0.02% of Full scale				
	Stability [v]	---	0.1% of full scale				
Physical	Weight	Kg	~9 Kg for NiLA2000 & NiLA3000 ~16 Kg for NiLA4500 & NiLA6000				
	Dimensions (W×H×D) [xii]	mm	444×44×475 (±1mm) for NiLA2000 & NiLA3000 Models. 444×88×475 (±1mm) for NiLA4500 & NiLA6000 Models.				
	Input Connector	---	Phoenix Contact screw plug connector, P/N: 1777846 for NiLA2000, NiLA3000 & NiLA4500 Models. Phoenix Contact screw plug connector, P/N: 1777859 for NiLA6000 Models.				
	Output Connector	---	Bus-bars for high current models with rated output current greater than 42A and Phoenix Contact screw plug connector (P/N: 1969454) for low current models with rated output current smaller than 42A.				

All specifications are subject to change without notice.

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[i] Optional 3 phase models with 171~265VAC input voltage range (nominal: 208VAC) are available upon request.
[ii] Over the specified input voltage range and for constant load using Remote Sense Connection.
[iii] From short circuit to rated output load at nominal input voltage.
[iv] Over 30 minutes operation at rated current after power on.
[v] Measured over 8 hours following 30 minutes of warm-up.
[vi] Following 30 minutes of warm-up.
[vii] Measured from 10% to 90% of rated current with resistive load, following run.
[viii] Measured from 90% to 10% of rated current with resistive load, following step change from 100% to 5% of rated output current.
[ix] Output current recovers to within 1% of current set point within 1ms for a 10% to 100% or 100% to 10% step load change.
[x] Over the specified input voltage range and for 95% of rated load.
[xi] For 50% of rated output power, by changing the value of connected resistive load.
[xii] The dimensions are just for the case, not containing L-brackets and terminals.

NiLA General Specifications

	Rated Output Voltage (V)	40	60	100	150	200
Power Supply Extension	Parallel Operation	Up to 4 units with the same rated Output Voltage in the master/slave mode.				
	Series Operation	Not Allowed.				
Analog Programming and Monitoring	Iout Voltage Programming[i]	0–5V or 0–10V Selectable by DIP switch, accuracy and linearity[ii]: ±1%.				
	Iout Resistive Programming	0–5KΩ or 0–10KΩ Selectable by DIP switch, accuracy and linearity[ii]: ±2%.				
	Voltage or Resistive Programming	Dry contact, open contact: voltage programming mode and short contact: resistive programming mode.				
	Output Voltage Monitoring[iii]	Electrical voltage: 0–5V or 0–10V, Selectable by DIP switch.				
	Output Current Monitoring[iii]	Electrical voltage: 0–5V or 0–10V, Selectable by DIP switch.				
	Power Supply OK Signal	Indicates power supply status by electrical voltage, 4V–5V: Run and 0V–1V: Stop.				
	Constant Current Mode Indicator (CC)	Open collector, CP mode: open and CC mode: short. Maximum applicable voltage is 40V and maximum sinking current is 10mA.				
	Constant Power Mode Indicator (CP)	Open collector, CC mode: open and CP mode: short. Maximum applicable voltage is 40V and maximum sinking current is 10mA.				
	Shut Down Control	Electrical voltage 0–0.5V/2–10V or Dry contact, OFF: 0–0.5V or short contact & ON: 2–10V or open contact.				
	Enable/Disable[iv]	Dry contact, Open: Disabled and Short: Enabled.				
	Output Current Local/Remote Analog Control	Electrical voltage 0–0.5V/2–10V or Dry contact, 0–0.5V or short contact: Remote, 2–10V or Open: Local.				
	Isolated Analog Programming and Monitoring Port	Optional				
Front Panel	Voltage Monitoring Accuracy	0.05% of rated Output Voltage.				
	Voltage Monitoring Resolution (mV)	10	10	100	100	100
	Current Monitoring Accuracy	0.5% of rated Output Current.				
	Current Monitoring Resolution	4 digit				
	Current Programming Accuracy	0.5% of rated Output Current.				
	Current Programming Resolution	4 digit				
	Power Monitoring Accuracy	0.5% of rated Output Power.				
	Power Monitoring Resolution	1W				
	Power Programming Accuracy	0.5% of rated Output Power.				
	Power Programming Resolution	1W				
Remote Controlling by Standard Interfaces	Optional Interfaces	Serial Interface Card, GPIB Interface Card or Ethernet Interface Card.				
	Serial Interface Card Connections	RS232/RS485 input port for PC connection, RS485 output port for chain connection to other power supplies and USB connection.				
	GPIB Interface Card Connections	GPIB connection, RS485 input port for PC connection and RS485 output port for chain connection to other power supplies.				
	Ethernet Interface Card Connections	Ethernet connection, RS485 input port for PC connection and RS485 output port for chain connection to other power supplies.				
	Voltage Monitoring Accuracy	0.01% of rated Output Voltage.				
	Voltage Monitoring Resolution	0.002% of rated Output Voltage.				
	Current Monitoring Accuracy	0.5% of rated Output Current.				
	Current Monitoring Resolution	0.003% of rated Output Current.				
	Current Programming Accuracy	0.5% of rated Output Current.				
	Current Programming Resolution	0.003% of rated Output Current.				
	Power Programming and Monitoring Accuracy/Resolution	Similar to the Front Panel Power Programming and Power Monitoring specifications.				

	Rated Output Voltage (V)	40	60	100	150	200
Protective Functions	Output Over-Voltage Protection	Fast operation by hardware. Over-Voltage limit is adjustable. Manual reset would be needed.				
	Over-Voltage Protection Limit Range (V)	43	64	107	160	215
	Output Over-Current Protection	Over-Current threshold is adjustable. Manual reset would be needed.				
	Over Temperature Protection	Automatic operation after over temperature removal.				
	AC Input Over-Voltage/Under-Voltage Protection	Automatic operation after AC input Over-Voltage/Under-Voltage removal.				
	Fan Malfunction or Disability	Automatic operation after removal of the malfunction.				
Environmental Conditions	Operating Temperature[v]	0–50°C, rated Output Power.				
	Storage Temperature	-25–70°C.				
	Humidity	Up to 95% RH (no condensation) at 0–50°C.				
	Altitude	Maximum 3000m. Derate Output Current by 3%/100m at altitudes above 2000m.				
	Cooling	Forced air cooling by variable speed internal fans, air flow: from front to rear, units can be stacked without any space.				
EMC	**Public low voltage limitations:**					
	IEC/EN 61000-3-2:2009	Limits for harmonic current emission.				
	IEC/EN 61000-3-2:2013	Limitations of voltage changes, voltage fluctuations and flicker emission.				
	Emissions:					
	CISPR11:2009 (EN 55022)	Conducted emission on AC lines class A (150KHz–30MHz).				
	CISPR11:2009 (EN 55022)	Radiated emission on AC lines class A (30MHz–1000MHz).				
	Immunity:					
	IEC/EN 61000-4-2:2008	Immunity to electrostatic discharge.				
	IEC/EN 61000-4-3:2010	Immunity to Radiated electromagnetic fields				
	IEC/EN 61000-4-4:2012	Immunity to electrical fast transient/burst.				
	IEC/EN 61000-4-5:2005	Immunity to surge.				
	IEC/EN 61000-4-6:2013	Immunity to conducted disturbances.				
	IEC/EN 61000-4-8:2009	Immunity to power frequency magnetic field.				
	IEC/EN 61000-4-11:2004	Immunity to voltage dips, short interruptions and voltage variations.				
Safety	Applied Standard	IEC 60950-1:2013-5				
	Classification of Connectors and Terminals	• Output terminals, Remote Sense Connections and non-isolated part of Analog Program Connector are SELV in models with Vout≤35V while the output voltage is not floated more than 16V from ground potential and are hazardous in other conditions and other models. • Isolated part of Analog Program Connector and Remote Programming Interfaces are SELV in all models.				
	Withstand Voltages (for all models)	Input to Output: 4242VDC, 1min. Input to Communication Circuits (SELV): 4242VDC, 1min. Input to Ground: 2828VDC, 1min. Output to Ground: 2687VDC, 1min. Output to Communication Circuits(SELV): 4242VDC, 1min.				

All specifications are subject to change without notice.

[i] Minimum programming Current is guaranteed to maximum 1% of the rated value.
[ii] Accuracy and linearity in the Constant Current Mode is specified without concerning warm-up of the power supply.
[iii] Minimum monitoring Voltage or Current is guaranteed to maximum 1% of the rated value.
[iv] This feature can be deactivated from the front panel to avoid additional wiring at the Analog Program port in normal operation.
[v] Models with extended operating temperature range are available upon request.

OUTLINE DRAWING

1. Mounting holes for fixing the power supply to the standard 19-inch rack, use M6 screws.
2. Wire screw terminals for low current models.
3. Bus-bars for high current models.
4. Chassis mounting holes, use M4 screws with proper length to avoid entering of screws into the unit more than 5mm.
5. Safety cover for input AC connector including cable strain relief.
6. Safety cover for output terminals.
7. Safety cover for remote sense connector