

## Product Features:

- Hot pluggable
- N+1 Redundancy
- Controlled, measured and reported by RS232, TCP/IP
- Modular design for accommodating high power applications
- 19Inch Rack Mount Type



## Input Specifications:

VOLTAGE	1P3W 240VAC (176~296Vac) 3Ø 4W 380VAC
FREQUENCY	45-66Hz
PROTECTION	Under & Over voltage
EFFICIENCY	95.5% Typical ( 3kW module ) 96.0% Typical ( 2kW module ) 95.0% Typical ( 1kW module )

## Output Specifications:

VOLTAGE	Default -54.0VDC
CURRENT	166.5A Max (3KW 3 modules)
ADJUSTMENT RANGE	-42VDC~58VDC
LINE REGULATION	±0.5% Max
LOAD REGULATION	±1.0% Max
TEMP REGULATION	±0.5% Max
NOISE	≤ 300mVp-p (3KW Module)
SETPOINT ACCURACY	±0.5%
OVER CURRENT	101~110%
PROTECTION	-59VDC over (recycle input to reset), Thermal Shutdown

## Status & Control signal:

COMMUNICATION- INTERFACE	RS232, TCP/IP, CAN Digital In&Output Alarms(8ports)
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## General Specifications:

OPERATING TEMP (Derating above)	-40℃ to +75℃ (3KW: +45℃ / 1&2KW: +55℃)
STORAGE TEMP	-40℃ ~ +80℃
OPERATING HUMIDITY	0% ~ 90%(Non-Condensing)
STORAGE HUMIDITY	0% ~ 95%(Non-Condensing)
COOLING	Fan cooling
ALTITUDE	2,000Meter
SIZE (W×D×H)	481.8mm X 417.1mm X 44.4mm

## Electromagnetic Compatibility:

EMISSIONS	EN61204/EN55022 Class A
HARMONIC CURRENT - EMISSIONS	EN61000-3-2
FLUCTUATIONS & FLICKER	EN61000-3-3
ELECTROSTATIC -DISCHARGE	EN61000-4-2
RADIATED EMI	EN61000-4-3
EFT/BURSTS	EN61000-4-4
SURGE TRANSIENTS	EN61000-4-5
CONDUCTED IMMUNITY	EN61000-4-6
VOLTAGE DIPS AND - SHORT INTERRUPTIONS	EN61000-4-11

## Standards & Approvals: (TBD)

UL/CUL	60950-1
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# NESPACE-48/3K

Rectifier Module  
54VDC / 3000W

### Product Features:

- Modular Design
- 1U Rack Mountable
- World Wide Safety Approval
- DSP Controller
- LED alarm indicated
- Hot pluggable
- Energy saving operation



### Input Specifications:

VOLTAGE	1Ø240VAC (85VAC ~ 297VAC) (Nominal 176~275Vac)
FREQUENCY	45-66Hz
INRUSH CURRENT	25A @ 240VAC
PROTECTION	Mains fuse in both lines
LEAKAGE	3.5mA Max @ 240VAC
EFFICIENCY	95.5% Typical
POWER FACTOR	> 0.98at 50% load or more
PROTECTION	Input Under voltage, Overvoltage

### Output Specifications:

VOLTAGE	54.0VDC
CURRENT	55.5A (Max 3KW)
ADJUSTMENT RANGE	42.0~58.0VDC
LINE REGULATION	±0.5% Max over entire input range
LOAD REGULATION	±0.5% Maximum
TEMP REGULATION	±0.5% Maximum
Overall REGULATION	±5.0% Maximum
RIPPLE	≤ 300mVp-p(3KW)
SETPOINT ACCURACY	±0.5%
OVER VOLTAGE PROTECTION	59VDC (recycle input to reset) Power derated, Thermal Shutdown

### Status & Control signals:

COMMUNICATION	CAN
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### General Specifications:

OPERATING TEMP	-40 °C to +75 °C, (Derating above +45 °C)
STORAGE TEMP	-40 °C to +85 °C
OPERATING HUMIDITY	0% to 95% (Non-Condensing)
STORAGE HUMIDITY	5% to 95% (Non-Condensing)
COOLING	Controlled Fan in a module
VIBRATION	10-55Hz, 2G, 3min period/60 min each(3 axes)
ACOUSTIC NOISE	≤58dBA at nominal input and full load
RELIABILITY	>350,000 Hrs MTBF (Ambient : 25°C)
SIZE (W×D×H)	108mm × 340mm × 44mm

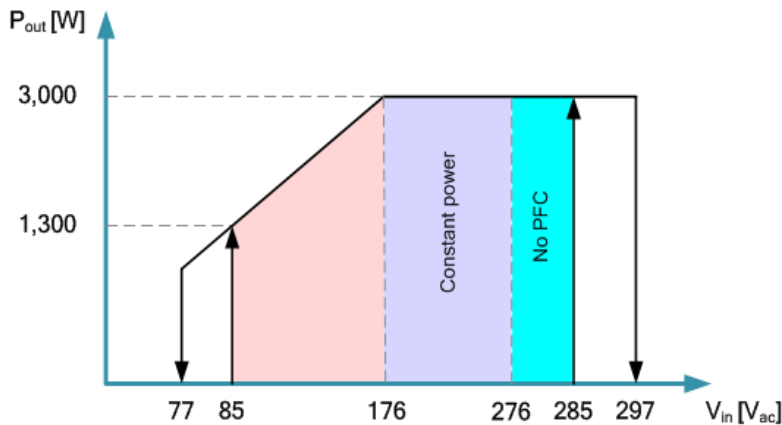
### Electromagnetic Compatibility:

EMISSIONS	EN55022 Level A (Conducted)
ELECTROSTATIC DISCHARGE	EN61000-4-2, 4KV Contact / 8KV Air
RADIATED SUSCEPTIBILITY	EN61000-4-3, 26-1000MHz, 10V/M, 80%AM
EFT/BURSTS	EN61000-4-4, 2KV
SURGE	EN61000-4-5
CONDUCTED IMMUNITY	EN61000-4-6, 0.15-800MHz, 10V 80%
VOLTAGE DIPS	EN61000-4-10, 95% Dip&10ms, 30% Dip&500ms
VOLTAGE INTERRUPTIONS	EN61000-4-11, 95% reduction, 5ms
FLUCTUATIONS & FLICKER	EN61000-3-3

### Standards & Approvals:

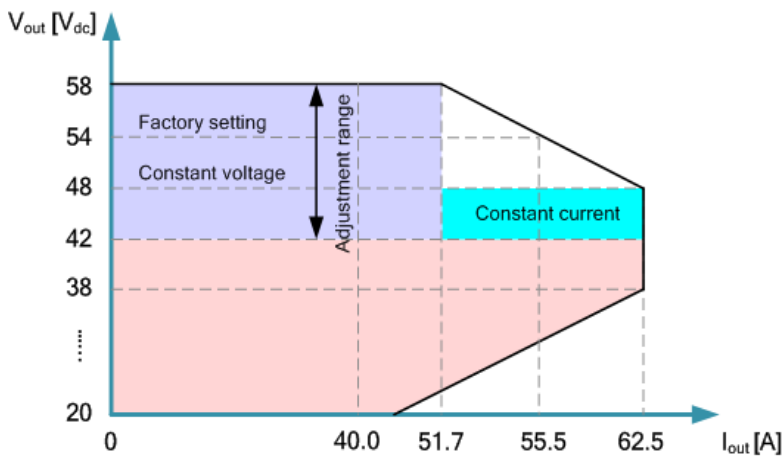
UL, CE, CB

### AC Input:



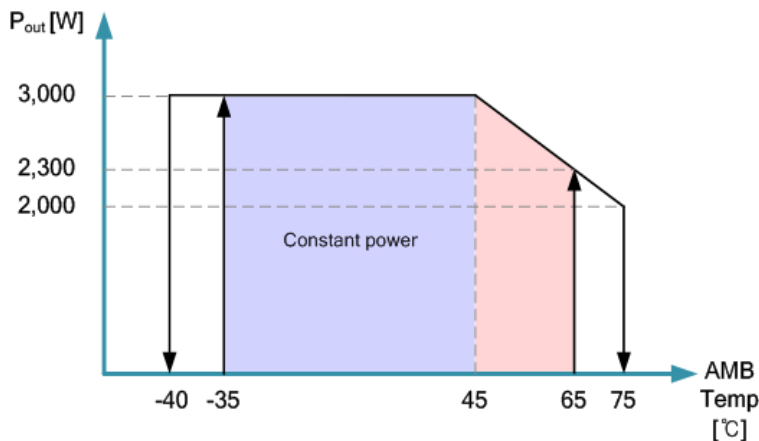
- Voltage range : 85Vac ~ 297Vac
- Constant power range (Max 3KW) : 176Vac~ 297Vac
- Shut-down. Voltage
  - OVP : 297Vac (recovery 285Vac)
  - UVP : 77Vac (recovery 85Vac)

### DC Output:



- Voltage range : -42.0Vdc ~ -58.0Vdc
- Constant power range (Max 3KW) : -48.0Vdc ~ -54.0Vdc

### Temperature:



- Operating temperature : -40°C ~ 75°C
- Constant power range (Max 3KW) : -40°C ~ 45°C
- Shut-down. Temperature (Tolerance: ±5°C)
  - : 75°C (recovery 65°C)
  - : -40°C (recovery -35°C)

## NESPACE-48/2K

Rectifier Module  
54VDC / 2000W

### Product Features:

- Modular Design
- 1U Rack Mountable
- World Wide Safety Approval
- DSP Controller
- LED alarm indicated
- Hot pluggable
- Energy saving operation



### Input Specifications:

VOLTAGE	1Ø240VAC (85VAC ~ 297VAC) (Nominal 176~275Vac)
FREQUENCY	45-66Hz
INRUSH CURRENT	25A @ 240VAC
PROTECTION	Mains fuse in both lines
LEAKAGE	3.5mA Max @ 240VAC
EFFICIENCY	96% Typical
POWER FACTOR	> 0.98at 50% load or more
PROTECTION	Input Under voltage, Overvoltage

### General Specifications:

OPERATING TEMP	-40 °C to +75 °C, (Derating above +55 °C)
STORAGE TEMP	-40 °C to +85 °C
OPERATING HUMIDITY	0% to 95% (Non-Condensing)
STORAGE HUMIDITY	5% to 95% (Non-Condensing)
COOLING	Controlled Fan in a module
VIBRATION	10-55Hz, 2G, 3min period/60 min each(3 axes)
ACOUSTIC NOISE	≤55dBA at nominal input and full load
RELIABILITY	>350,000 Hrs MTBF (Ambient : 25°C)
SIZE (W×D×H)	108mm × 340mm × 44mm

### Output Specifications:

VOLTAGE	54.0VDC
CURRENT	37A (Max 2KW)
ADJUSTMENT RANGE	42.0~58.0VDC
LINE REGULATION	±0.5% Max over entire input range
LOAD REGULATION	±0.5% Maximum
TEMP REGULATION	±0.5% Maximum
Overall REGULATION	±5.0% Maximum
RIPPLE	≤ 250mVp-p(2KW)
SETPOINT ACCURACY	±0.5%
OVER VOLTAGE PROTECTION	59VDC (recycle input to reset) Power derated, Thermal Shutdown

### Electromagnetic Compatibility:

EMISSIONS	EN55022 Level A (Conducted)
ELECTROSTATIC DISCHARGE	EN61000-4-2, 4KV Contact / 8KV Air
RADIATED SUSCEPTIBILITY	EN61000-4-3, 26-1000MHz, 10V/M, 80%AM
EFT/BURSTS	EN61000-4-4, 2KV
SURGE	EN61000-4-5
CONDUCTED IMMUNITY	EN61000-4-6, 0.15-800MHz, 10V 80%
VOLTAGE DIPS	EN61000-4-10, 95% Dip&10ms, 30% Dip&500ms
VOLTAGE INTERRUPTIONS	EN61000-4-11, 95% reduction, 5ms
FLUCTUATIONS & FLICKER	EN61000-3-3

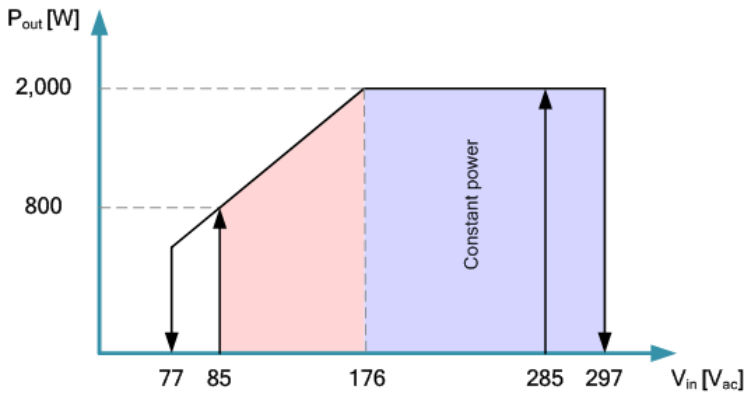
### Status & Control signals:

COMMUNICATION	CAN
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### Standards & Approvals:

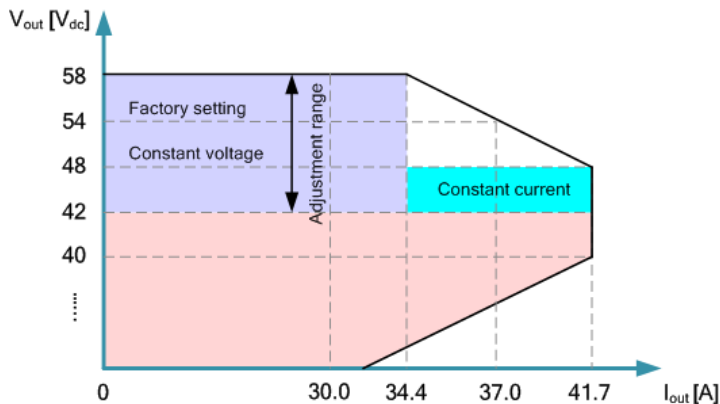
UL, CE, CB

### AC Input:



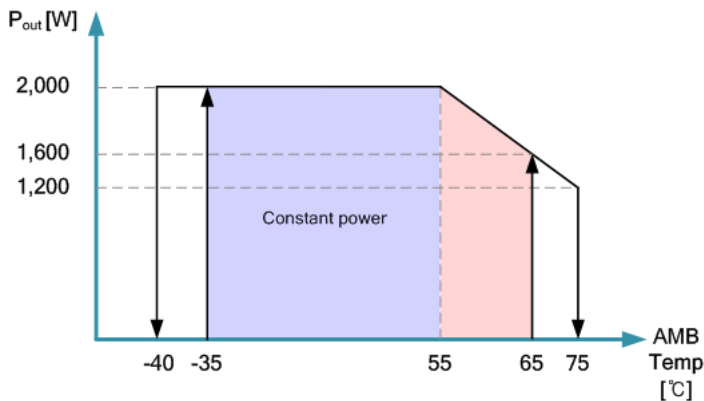
- Voltage range : 85Vac ~ 297Vac
- Constant power range (Max 2KW) : 176Vac~ 297Vac
- Shut-down. Voltage
  - OVP : 297Vac (recovery 285Vac)
  - UVP : 77Vac (recovery 85Vac)

### DC Output:



- Voltage range : -42.0Vdc ~ -58.0Vdc
- Constant power range (Max 2KW) : -48.0Vdc ~ -54.0Vdc

### Temperature:



- Operating temperature : -40°C ~ 75°C
- Constant power range (Max 2KW) : -40°C ~ 55°C
- Shut-down. Temperature (Tolerance:  $\pm 5^\circ\text{C}$ )
  - : 75°C (recovery 65°C)
  - : -40°C (recovery -35°C)

## NESPACE-48/1K

Rectifier Module  
54VDC / 1000W

### Product Features:

- Modular Design
- 1U Rack Mountable
- World Wide Safety Approval
- DSP Controller
- LED alarm indicated
- Hot pluggable
- Energy saving operation



### Input Specifications:

VOLTAGE	1Ø240VAC (85VAC ~ 297VAC) (Nominal 176~275Vac)
FREQUENCY	45-66Hz
INRUSH CURRENT	15A @ 240VAC
PROTECTION	Mains fuse in both lines
LEAKAGE	3.5mA Max @ 240VAC
EFFICIENCY	95% Typical
POWER FACTOR	> 0.98at 50% load or more
PROTECTION	Input Under voltage, Overvoltage

### Output Specifications:

VOLTAGE	54.0VDC
CURRENT	18.5A (Max 1KW)
ADJUSTMENT RANGE	42.0~58.0VDC
LINE REGULATION	±0.5% Max over entire input range
LOAD REGULATION	±0.5% Maximum
TEMP REGULATION	±0.5% Maximum
Overall REGULATION	±5.0% Maximum
RIPPLE	≤ 250mVp-p(1KW)
SETPOINT ACCURACY	±0.5%
OVER VOLTAGE PROTECTION	59VDC (recycle input to reset) Power derated, Thermal Shutdown

### Status & Control signals:

COMMUNICATION	CAN
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### General Specifications:

OPERATING TEMP	-40 °C to +75 °C, (Derating above +55 °C)
STORAGE TEMP	-40 °C to +85 °C
OPERATING HUMIDITY	0% to 95% (Non-Condensing)
STORAGE HUMIDITY	5% to 95% (Non-Condensing)
COOLING	Controlled Fan in a module
VIBRATION	10-55Hz, 2G, 3min period/60 min each(3 axes)
ACOUSTIC NOISE	≤55dBA at nominal input and full load
RELIABILITY	>350,000 Hrs MTBF (Ambient : 25°C)
SIZE (W×D×H)	108mm × 340mm × 44mm

### Electromagnetic Compatibility:

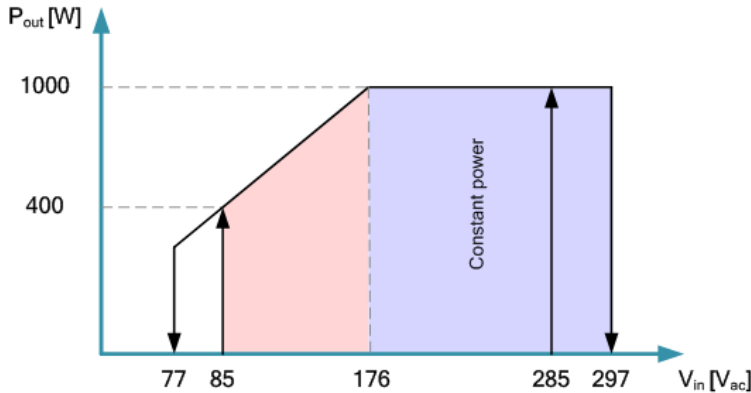
EMISSIONS	EN55022 Level A (Conducted)
ELECTROSTATIC DISCHARGE	EN61000-4-2, 4KV Contact / 8KV Air
RADIATED SUSCEPTIBILITY	EN61000-4-3, 26-1000MHz, 10V/M, 80%AM
EFT/BURSTS	EN61000-4-4, 2KV
SURGE	EN61000-4-5
CONDUCTED IMMUNITY	EN61000-4-6, 0.15-800MHz, 10V 80%
VOLTAGE DIPS	EN61000-4-10, 95% Dip&10ms, 30% Dip&500ms
VOLTAGE INTERRUPTIONS	EN61000-4-11, 95% reduction, 5ms
FLUCTUATIONS & FLICKER	EN61000-3-3

### Standards & Approvals:

UL, CE, CB

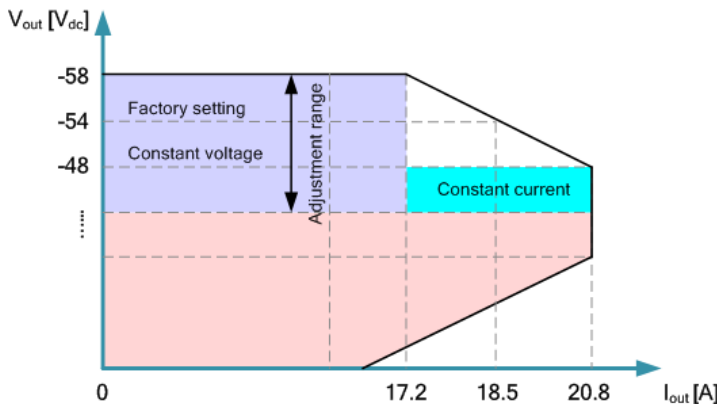


### AC Input:



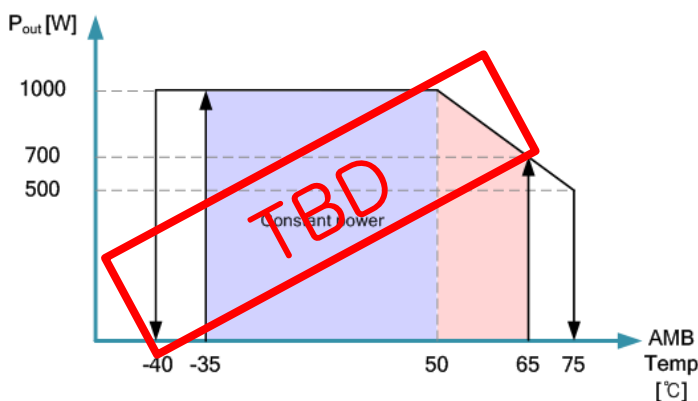
- Voltage range : 85Vac ~ 297Vac
- Constant power range (Max 1KW) : 176Vac~ 297Vac
- Shut-down. Voltage
  - OVP : 297Vac (recovery 285Vac)
  - UVP : 77Vac (recovery 85Vac)

### DC Output:



- Voltage range : -42.0Vdc ~ -58.0Vdc
- Constant power range (Max 1KW) : -48.0Vdc ~ -58Vdc

### Temperature:



- Operating temperature : -40°C ~ 75°C
- Constant power range (Max 1KW) : -40°C ~ 50°C
- Shut-down. Temperature (Tolerance:  $\pm 5^\circ\text{C}$ )
  - : 75°C (recovery 65°C)
  - : -40°C (recovery -35°C)

## Product Features :

- RS 232 interface for PC connection, TCP/IP, SNMP V1, SNMP V2C
- Adjustable Output Voltage
- AC Input High/Low Voltage Alarm

## Display :

- Status of the rectifier system is displayed on the LCD :
  - Output voltage/Input voltage
  - Output load current
  - Rectifier Temperature
  - Rectifier system setup value and alarms
  - Display output currents for individual rectifier modules

## Analog Measurements (Tolerance : Full Scale $\pm 0.5\%$ ) :

- Rectifier input AC voltage
- Rectifier output DC voltage
- Rectifier load current
- Rectifier temperature

## Controller Unit Function :

- Failure of the rectifier controller shall not affect the operation of the rectifiers in the system
  - Store and display 1,000 event alarm logs & 1,000 data logs
  - †Digital Input Alarm (User Defined alarms)
  - †Dry Contact Alarm (User Defined alarms)
- † : The number of alarm can vary depending on the shelf

## Battery Managements :

- Battery charge/discharge current/the battery set and the total output/  
Battery Temperature Display and Measurement
- Manual/Float/Equal charging mode exchangeable
- Battery Charging Current Limiting
- Temperature Compensated Charge Voltage for increased battery Lifetime
- Setting of Battery Temperature Compensation Curve



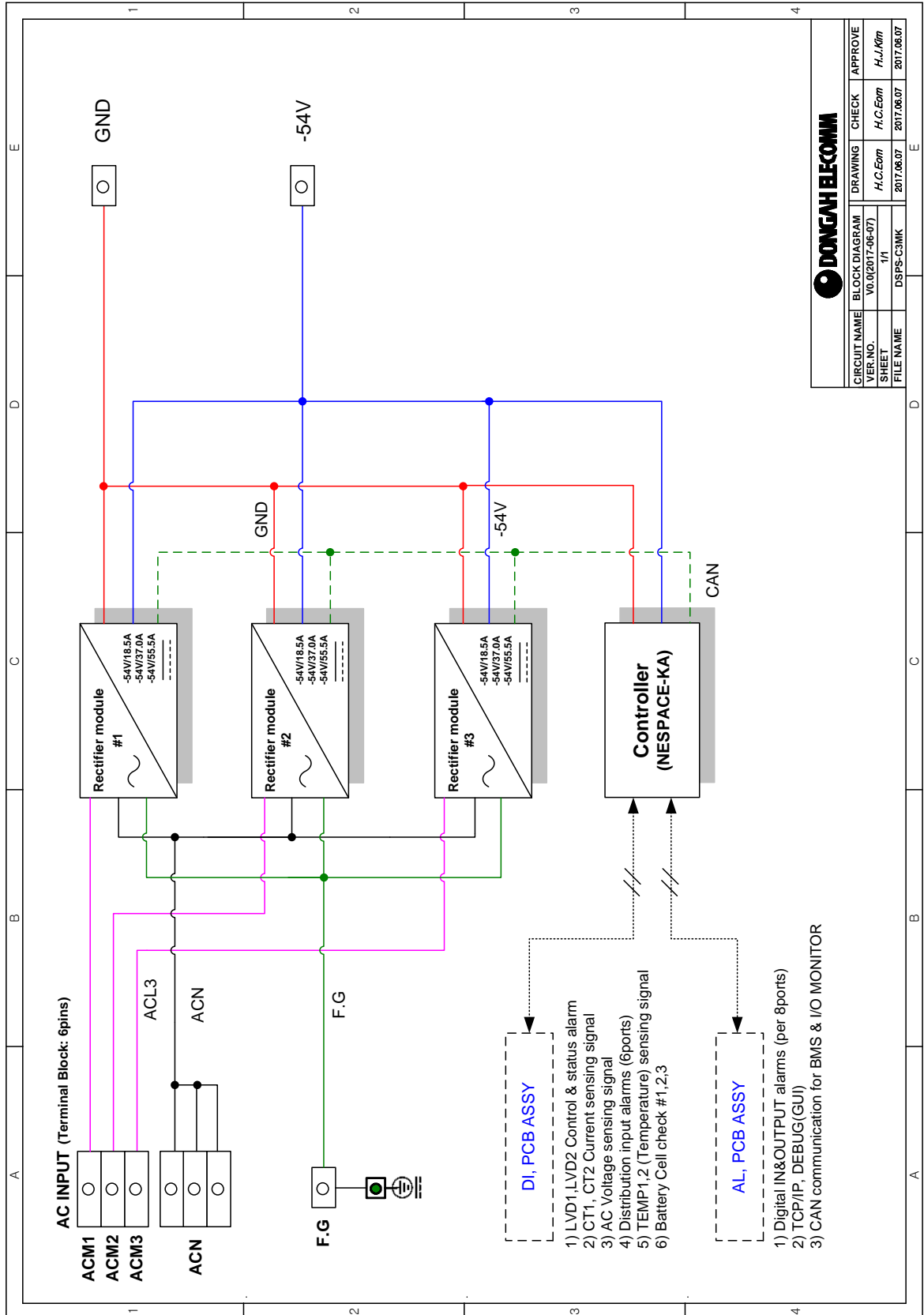
## CPU :

- Coretex-M4 Core
- CPU Clock – Up to 150MHz
- 32ch DMA, 16KB cache, DSP, floating-point unit
- Memory : Flash 1MB / RAM128KB / EEPROM / Flax RAM, Flax NVM
- Ethernet, UART, RS485
- Support RTOS

## Interface :

- RS232
  - Baud Rate : 115,200 bps
  - Data Bits : 8Bit / Stop Bits : 1Bit / Parity Bits : N
- LAN
  - Hardwired TCP/IP protocol(TCP/UDP/ICMP/Ethernet)
  - 10BaseT/100BaseTX Ethernet MAC/PHY Embedded
  - Auto Negotiation(Full and half duplex, 10/100-Based)
  - Auto MDI/MDIX(Straight-through or Crossover)





		DRAWING	CHECK	APPROVE
		H.C. Eom	H.C. Eom	H.J. Kim
CIRCUIT NAME	BLOCK DIAGRAM	VER. NO.	SHEET	FILE NAME
	V0.0(2017-06-07)	1/1	DS-PS-C3MK	2017.06.07

Front View:



**Control Module (NESPAC-KA)**

**Rectifier Modules**

- 9KW (3KW x3EA) / 6KW (2KW x3EA) / 3KW (1KW x3EA)

Rear View:

**AC INPUT**

- ACN : 3ports (common)
- ACL : 3ports (ACM1,2,3)

**GND BUS-BAR (M6)**

**-54V BUS-BAR (M6)**

**AL, PCB ASSY connection**

- Digital IN&OUTPUT alarms (per 8ports)
- TCP/IP, DEBUG (GUI)
- CAN communication for BMS & I/O MONITOR

**Frame Ground (M4)**

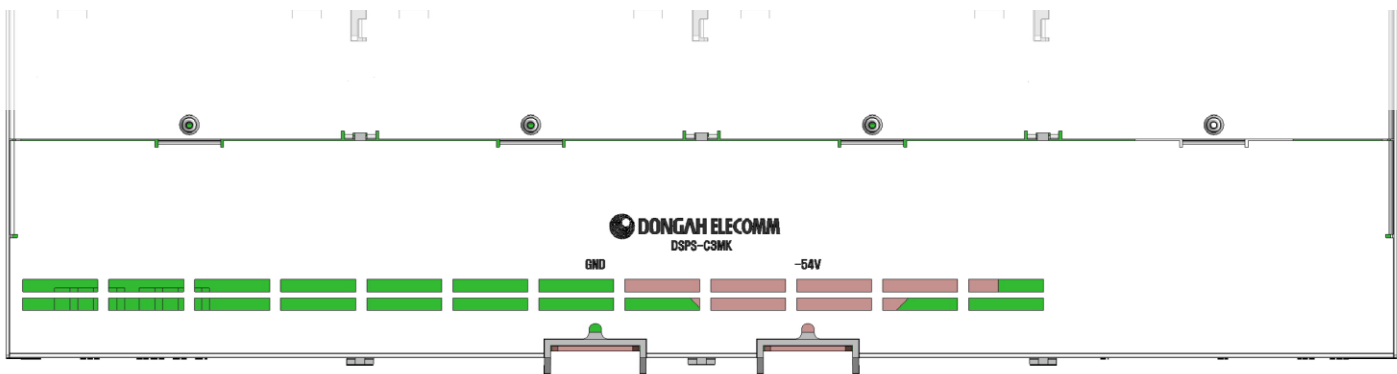
**DI, PCB ASSY connection**

- LVD1,LVD2 Control & status alarm
- CT1, CT2 Current sensing signal
- AC Voltage sensing signal
- Distribution input alarms (6ports)
- TEMP1,2 (Temperature) sensing signal
- Battery Cell check #1,2,3

**CAN (communication)**

- CAN : Next Layer contact
- END : for termination resistor

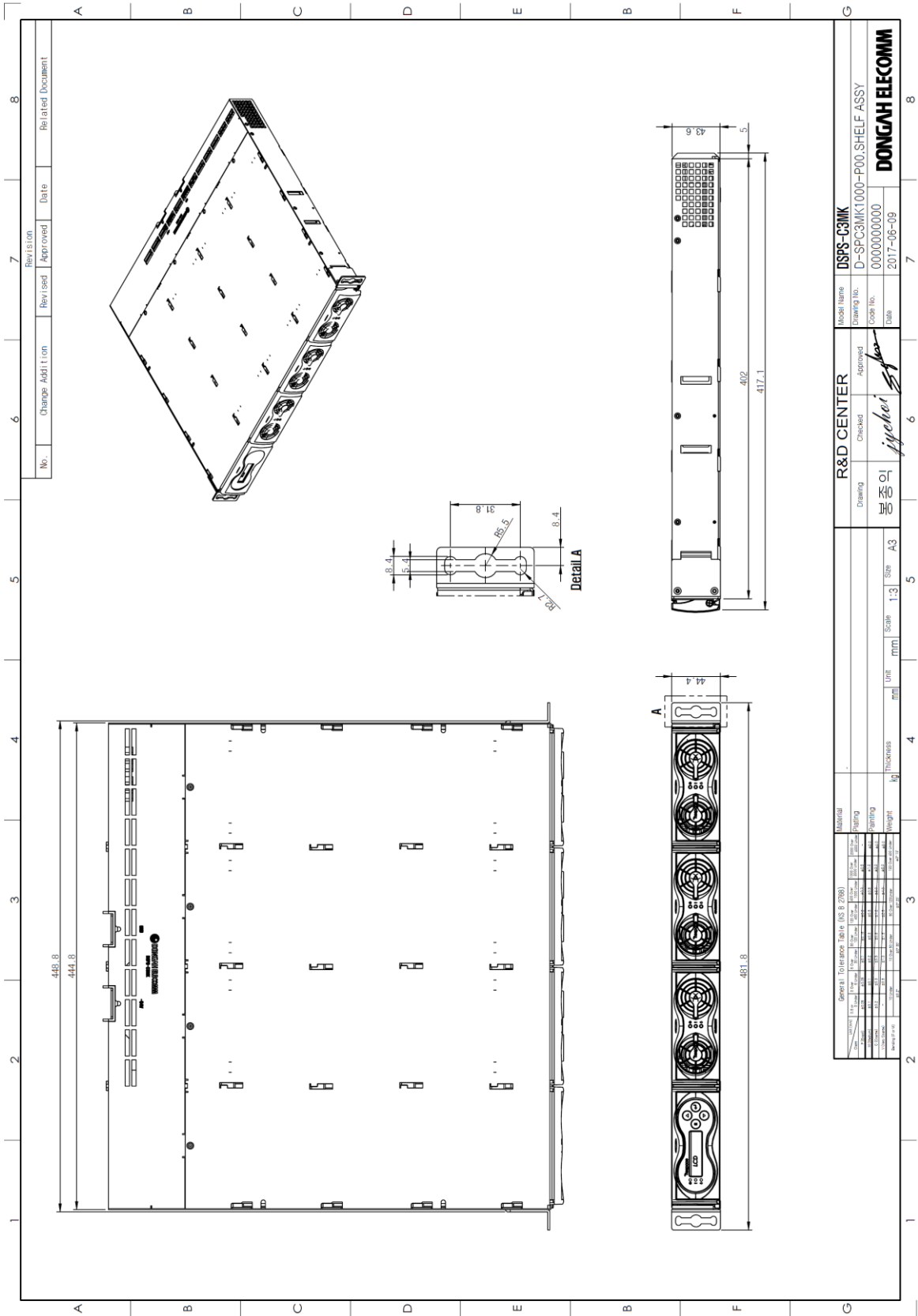
Top View: (rear cover)



# DSPS-C3MK (Shelf type)

the  
**POWER**  
you need

## Dimension



**DONGAH ELECOMM**  
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www.dongahusa.com

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