

CSPS-6K (Shelf Type)

the
POWER

REV: 081418

POWER SHELF



PRODUCT FEATURES:

- Hot pluggable
- n+1 Redundancy
- Controlled, measured and reported by TCP/IP
- Modular design for accommodating high power applications
- 19 Inch Rack Mount Type
- Optional communication module available for SNMPv3 support

INPUT SPECIFICATIONS:

VOLTAGE	1P3W 240VAC $\pm 20\%$ (Nominal)
FREQUENCY	47~63 Hz
PROTECTION	Under & Over voltage
EFFICIENCY	96.0% Typical (2KW module)

OUTPUT SPECIFICATIONS:

OUTPUT VOLTAGE	DEFAULT -53.5VDC
OUTPUT CURRENT	6KWatt Max (2KW x 3 modules)
ADJUSTMENT RANGE	-42VDC ~ -58VDC
LINE REGULATION	$\pm 0.5\%$ Max
LOAD REGULATION	$\pm 1.0\%$ Max
TEMP REGULATION	$\pm 0.5\%$ Max
NOISE	$\leq 250\text{mVp-p}$ (2KW modules)
SETPOINT ACCURACY	$\pm 0.5\%$
OVER CURRENT	101~110%
PROTECTION	-59VDC over Thermal Shutdown

STATUS & CONTROL SIGNALS:

COMMUNICATION INTERFACE	TCP/IP
	Dry Contacts Alarm (6 EA)
	Digital Input Alarm (4 EA)

GENERAL SPECIFICATIONS:

OPERATING TEMPERATURE	-40°C ~ +55°C (Derating above +55°C): 2KW
STORAGE TEMPERATURE	-40°C ~ +80°C
OPERATING HUMIDITY	10% ~ 95% (Non-Condensing)
STORAGE HUMIDITY	5% ~ 95% (Non-Condensing)
COOLING	Fan cooling
ALTITUDE	2,000Meter
SIZE (WxDxH)	444.8mm x 417mm x 44.4mm (Shelf)

ELECTROMAGNETIC COMPATIBILITY (TBD):

EMISSIONS	EN55022 Class A
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
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/CUL	60950-1
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REV: 080518

PRODUCT FEATURES:

- 1RU Height, 2000W Rectifier Module
- High Efficiency (96% at 30%~70% Load)
- Universal AC Input
- Active PFC for EN61000-3-2 Class D Compliance
- DSP Control; Energy Efficient Operation
- Front Panel LED Indicators
- Full 2000W up to +55°C (derates up to +75°C)
- CAN Bus Communication
- International Safety Approvals



INPUT SPECIFICATIONS:

VOLTAGE	85VAC ~ 285VAC; see Derating for < 176VAC
FREQUENCY	45Hz ~ 63 Hz
INRUSH	≤ 20A @ 230VAC Full Load (Max Cold Start)
CURRENT	≤ 10A @ 230VAC (Max Continuous)
PROTECTION	15A Fuse, each line (L, N); TVS for Transients
LEAKAGE	< 3.5mA @ 264VAC
INPUT PROTECTION	Input Undervoltage; Output Overvoltage
EFFICIENCY	96% typical (30%~70% Load)
HARMONICS	EN61000-3-2 Class D (>0.99PF; > 50% load)

OUTPUT SPECIFICATIONS:

OUTPUT VOLTAGE	54Vdc (typical)
OUTPUT CURRENT	37A (2KW max, continuous) @ AC input ≥ 176V
LINE REGULATION	±0.5%, across full input range
LOAD REGULATION	±0.5%, across full load range
RIPPLE	≤250mV p-p; ≤ 20mVrms (20MHz BW)
OUTPUT ADJUSTMENT	43.5Vdc ~ 58Vdc
EXCURSION	±3% max, 50% Step Load
RECOVERY	100ms, max
OVER-CURRENT	OCP (see Power Derating curves)
PROTECTION	OVP, Power Deratings, Thermal Shutdown

STATUS LED & COMMUNICATION:

STATUS LED/[ALARM]	Green=OK; Yellow=[Minor]; Red=[Major]
COMMUNICATION	CAN Bus

SAFETY STANDARDS:

UL/cUL	IEC/UL 60950-1
CE MARK	Low Voltage Directive
NEBS	Designed to Meet Telcordia GR-63-CORE (pending)

GENERAL SPECIFICATIONS:

OPERATING TEMPERATURE	-40°C to +75°C (derate 2%/°C above +55°C)
OPERATING HUMIDITY	10% ~ 95% (non-condensing)
STORAGE	-40°C to +85°C; 5% ~ 95% RH (non-condensing)
COOLING	Intelligent Fan; Front-to-back airflow
ACOUSTIC NOISE	< 55dBA (nominal input, full load, Ta > 40°C)
VIBRATION	10-55Hz, 2G, 3Min Period, 60 min each (3 axes)
SHOCK	20G Peak Acceleration
RELIABILITY	>350K Hours (per MIL STD 217F)
SIZE (WxDxH)	108.2mm x 321.7mm x 41.0mm
WEIGHT	2.18kg (4.8 lbs)
INSULATION	3KVAC I-O; 1.5KVAC I-Earth; 0.5KVDC O-Earth

EMISSIONS:

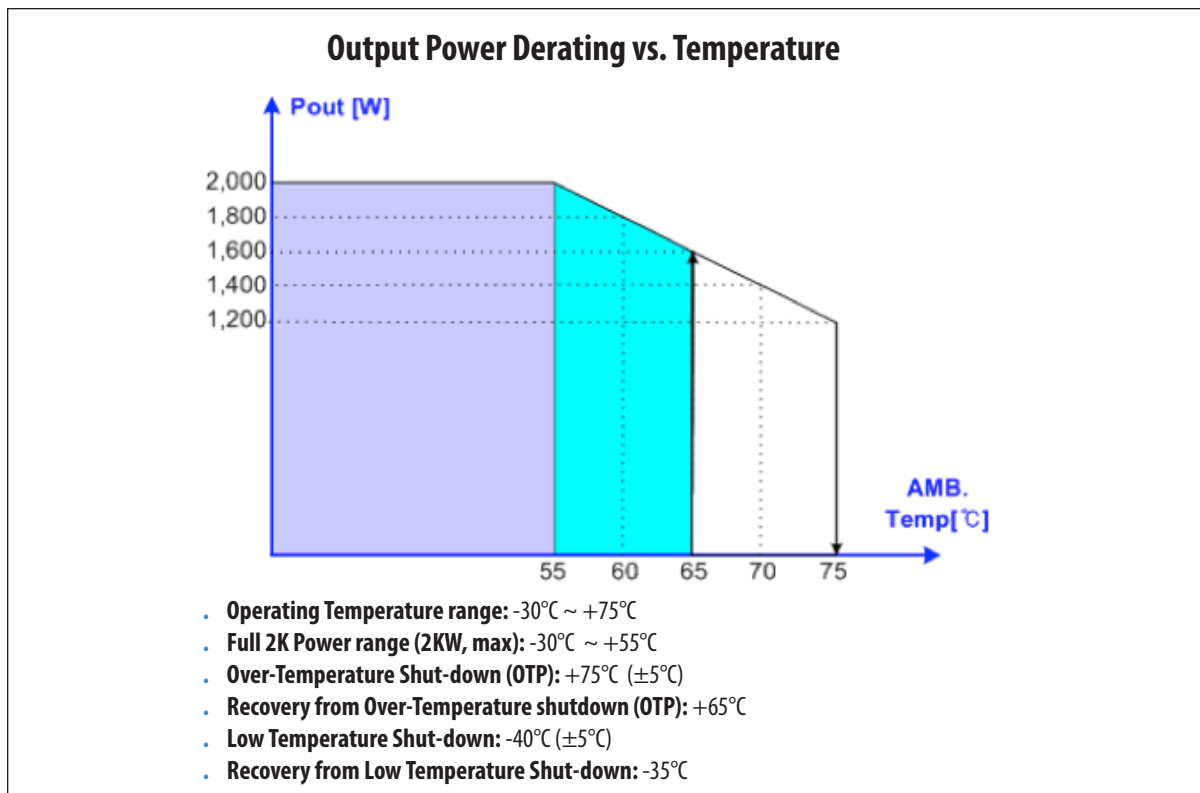
EMISSIONS	EN55022 Level B (Conducted)
ELECTROSTATIC DISCHARGE	EN61000-4-2, 4KV Contact/ 8KV Air
RADIATED SUSCEPTIBILITY	EN61000-4-3, 26MHz-2000MHZ, 10V/m, 80%AM
EFT/BURSTS	EN61000-4-4, 2KV
SURGES	EN61000-4-5, 2KV Earth, 1KV Line-Line
CONDUCTED IMMUNITY	EN61000-4-6, 150KHz-80MHz, 10Vrms, 80%AM
VOLTAGE DIPS	EN61000-4-10, 95% Dip, 10ms / 30% Dip, 500ms
VOLTAGE INTERRUPTIONS	EN61000-4-11, 95% reduction, 5ms
FLUCTUATIONS & FLICKER	EN61000-3-3

OUTPUT MODELS:

Output Model:	Rectifier Output		
	VDC	Io (Min)	Io (Max)
NESPACE-48/2K	54V	0A	37A



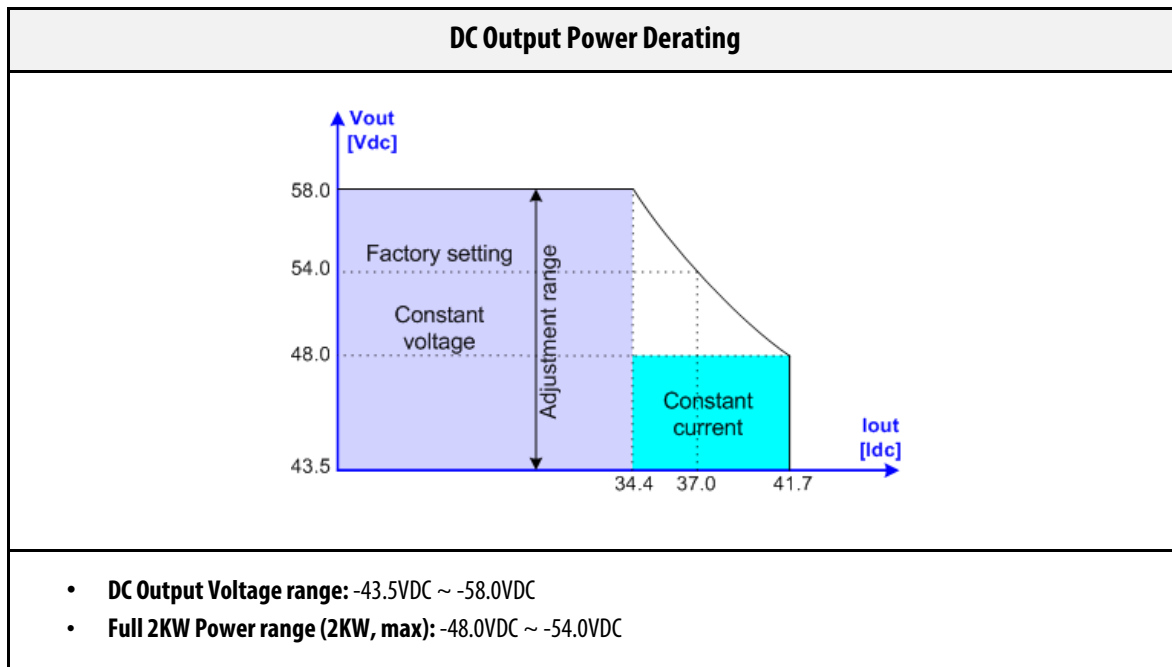
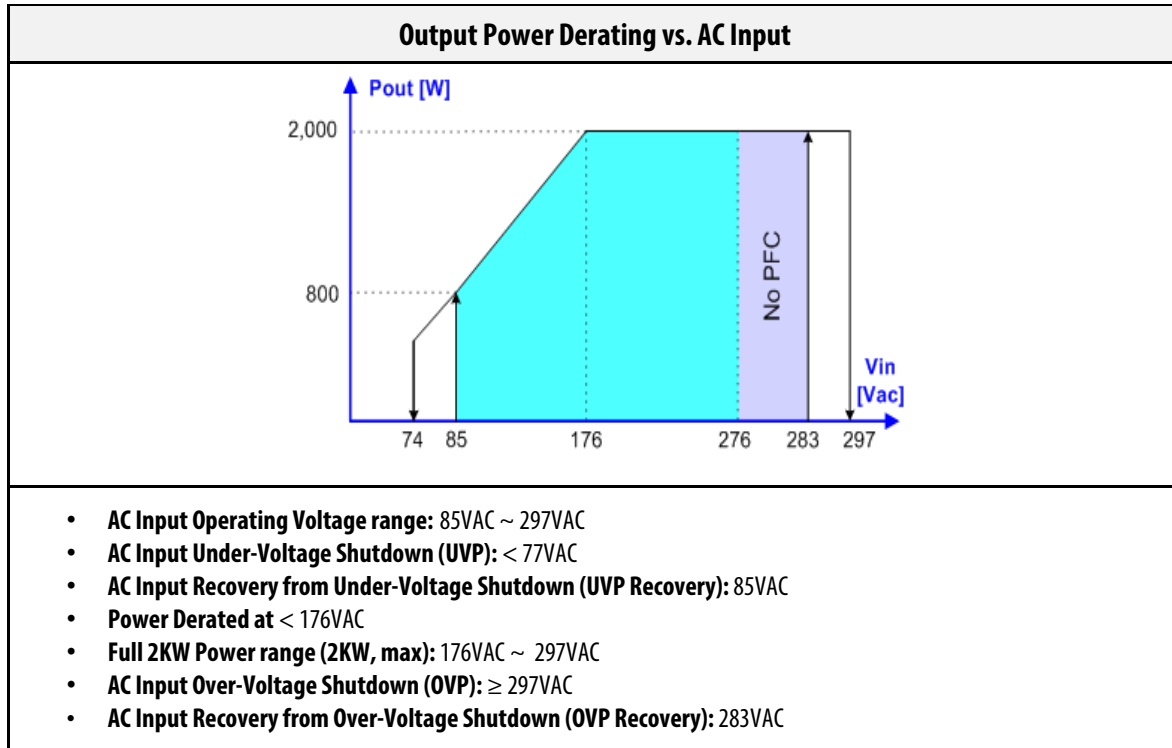
DERATING CURVES:



NESPACE RECTIFIER FRONT PANEL INDICATORS	
ALARMS	
-	Low AC Mains / Shutdown
-	AC Input out-of-range; LEDs Flashing at AC Overvoltage
-	High Temperature Shutdown
-	Low Temperature Shutdown
-	Rectifier Failure
-	DC Output Overvoltage Shutdown
-	Fan Failure
-	DC Low Voltage Alarm at 43.0V
WARNINGS	
-	Rectifier in Power Derate mode
-	Loss of CAN Communication with Control Unit (stand-alone mode)
VISUAL INDICATORS	
■	GREEN LED: Rectifier is ON with no alarms or warnings
■	YELLOW LED: Rectifier Warning
■	RED LED: Rectifier Failure



DERATING CURVES:



REV: 100417

Control Module

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 alarms can vary depending on the shelf

CPU:

- Cortex-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)
 - Auto Negotiation(Full and half duplex, 10/100-Based)
 - Auto MDI/MDIX (Straight-through or Crossover)



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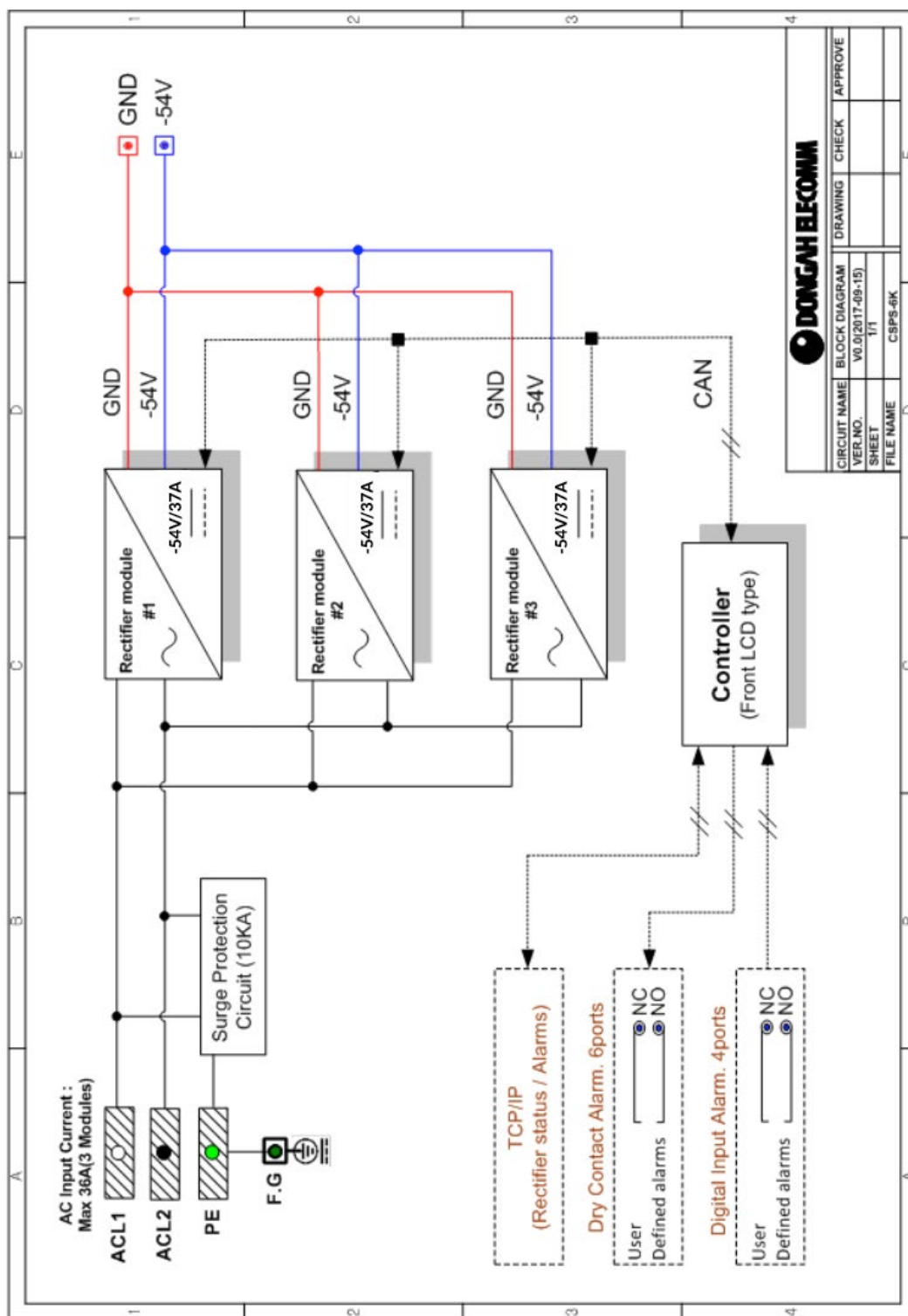
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BLOCK DIAGRAM:



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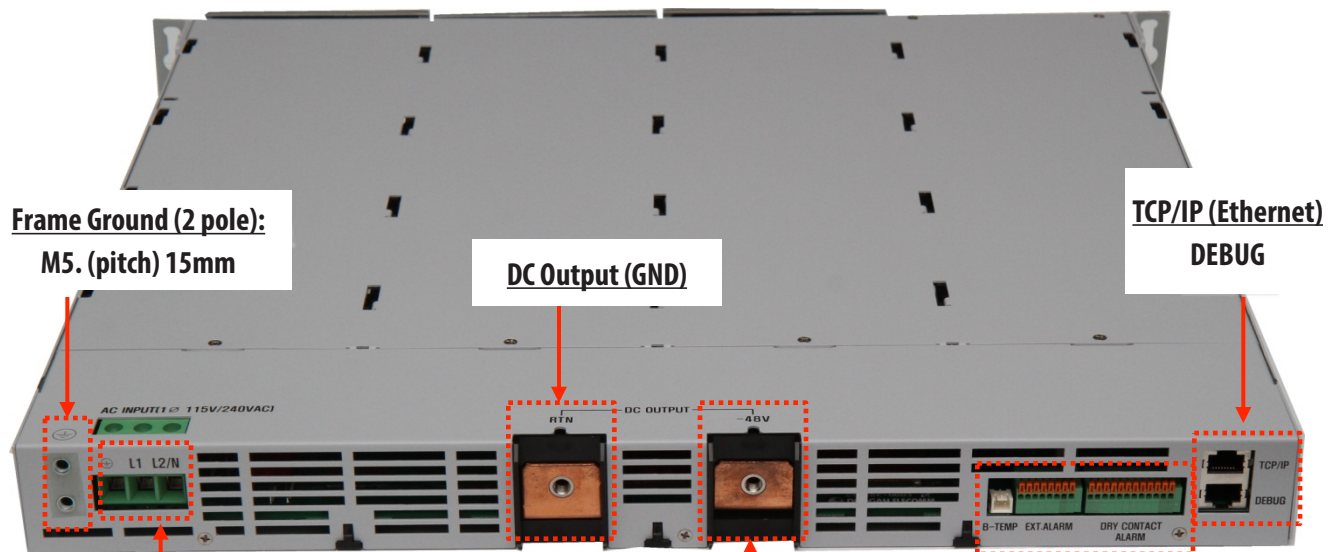
FRONT VIEW:



User Logo & Model Name

Rectifier Module:
2KW x 3EA (Max)

REAR VIEW:



Frame Ground (2 pole):
M5. (pitch) 15mm

DC Output (GND)

TCP/IP (Ethernet)
DEBUG

AC Input (3 ports):
PE, ACL1, ACL2/N

DC Output (-48V)

EXT (Digital Input) ALARM: 4 ports
DRY CONTACT ALARM: 6 ports



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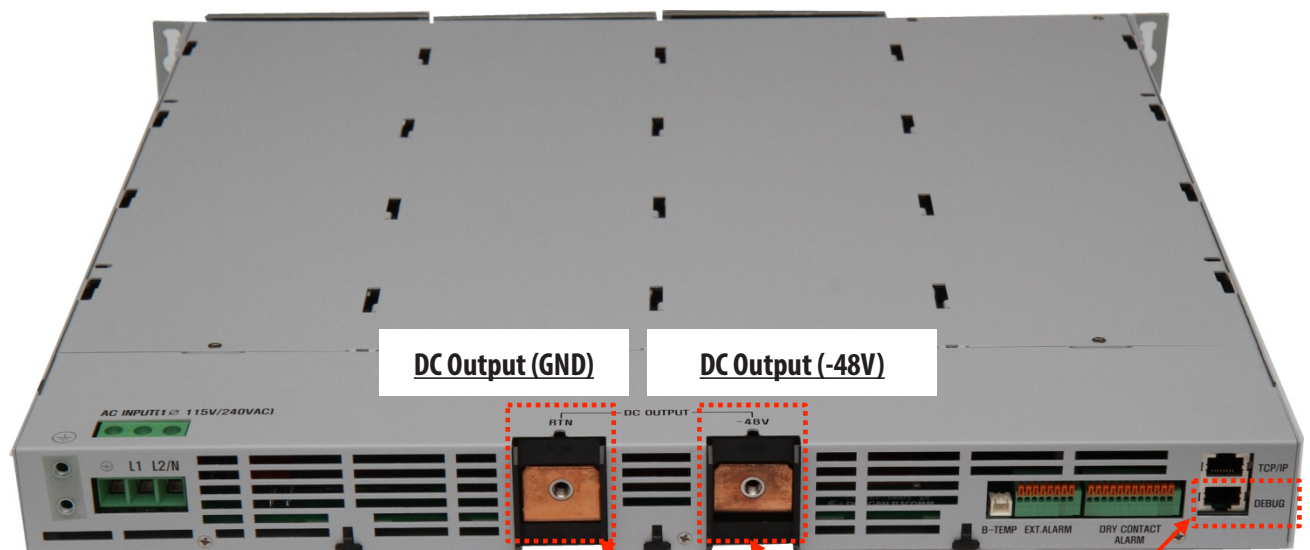
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CSPS-6K (SNMPv3 Module)

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Communication Module

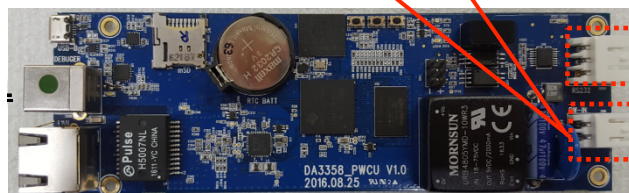
REAR VIEW:



DEBUG

USB SERIAL

ETHERNET



RS232

INPUT POWER



Communication module to be fully enclosed;
datasheet to be updated upon completion.



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