



V-series (Rectifier Module)

Overview:

Eltek Valere rectifier modules provide unprecedented power density and power levels in a true plug and play format. With a wide range of available voltages, power ratings, and form factors, the rectifiers allow optimal system design and cost effective deployment from initial install through future upgrades

The Eltek Valere Difference

Optimization

Eltek Valere rectifiers are optimized for the demanding power needs of wireless communications, enterprise and broadband access equipment.

Small size, big power

At only 2RU, these compact rectifiers can provide up to 2800 Watts of power. The small size can free up space to reduce system size or incorporate additional electronics.

Industry leading efficiency

An industry leading 92% efficiency reduces the thermal load thus improving the over-all reliability and availability of the system.

Flexibility

These rectifiers are designed to operate as an integral component in Eltek Valere's Compact, Integrated, or Enterprise DC Power Systems. They are extremely flexible and can be operated either with a system controller or as a stand-alone module in telecommunication and enterprise applications.

Features

- ⊗ 90VAC to 264VAC Input
- ⊗ Up to 92% efficiency
- ⊗ Power Factor Correction
- ⊗ Hot Pluggable
- ⊗ Front panel LED indicators
- ⊗ I²C Serial Communications bus
- ⊗ AC Fail Alarm
- ⊗ DC Fail Alarm
- ⊗ Over-temperature Alarm
- ⊗ UL Recognized to EN60950
- ⊗ CSA Certified
- ⊗ VDE Certified
- ⊗ CE Mark for Low Voltage Directive

(V-series Rectifier Module)

Additional Technical Specifications

AC Input Specifications

V SERIES	V250A	V0500A	V0750A	V1000A	V1250A	V1500A	V2000A	V2500A	V0500B	V1000B	V1500B	V0500C	V0750C	V2000D	
Input Voltage (min)	90 Vac				180 Vac				90 Vac		180 Vac	90 Vac		90 Vac	180 Vac
Input Voltage (max)	264 Vac														
Input Frequency (min)	47 Hz														
Input Frequency (max)	63 Hz														
Input Current (max)															
@ 100 Vac (amps)	3.6	6.5	9.8	13.0	15	-	-	-	6.7	13.3	-	6.5	9.5	15.0	15.0
@ 120 Vac (amps)	3.0	5.4	8.2	10.9	13	-	-	-	5.6	11.1	-	5.5	7.9	12.3	12.3
@ 180 Vac (amps)	2.0	3.6	5.4	7.2	9	10.9	14.5	18.1	3.7	7.4	10.9	3.7	5.3	16.0	16.0
@ 208 Vac (amps)	1.8	3.1	4.7	6.3	7.5	9.4	12.5	15.7	3.2	6.4	9.4	3.2	4.6	14.0	14.0
Inrush Current (max)	30 amps peak (excludes X caps in the EMC input filter)														
Power Factor	.95 @ 230Vac	.98 typ. @ 230Vac, full load		.99 @ typ. @ 230Vac, full load					.98 typ. @ 230Vac, full load		.99 @ typ. @ 230Vac, full load		.98 typ. @ 230Vac full load		.98 typ. @ 230Vac, full load

DC Output Specifications

V SERIES	V250A	V0500A	V0750A	V1000A	V1250A	V1500A	V2000A	V2500A	V0500B	V1000B	V1500B	V0500C	V0750C	V2000D	
Vo Set Point (min/typ/max)	42/48/56 Vdc								21/24/28 Vdc			10.5/12/14 Vdc		30/60/80 Vdc	
Regulation (min/max)	±1 (%) (Total regulation line, load, aging & temperature)														
Output Current (min/max amps)	0/5	0/10	0/15	0/20	0/25	0/30	0/40	0/50	0/20	0/40	0/60	0/40	0/60	0/20 @ 30-63Vdc 0/10 @ 64-80Vdc	0/40 @ 30-63Vdc 0/20 @ 64-80Vdc
Output Power (watts max)	280	560	840	1120	1400	1680	2240	2800	560	1120	1680	560	840	1600 @ 30-63Vdc 800 @ 64-80Vdc	3200 @ 30-63Vdc 1600 @ 64-80Vdc
Current Limit Setpoint (min/max amps)	5.5/7	10.5/12	15.5/18	21/24	26/30	31/36	42/48	52/60	21/24	42/48	63/72	42/48	63/72	21/24 @ 30-63Vdc 10.5/12 @ 64-80Vdc	42/48 @ 30-63Vdc 21/24 @ 64-80Vdc
Short Circuit Current (peak amps)	10	20	25	30	38	45	60	75	30	60	90	60	90	30 @ 30-63Vdc 20 @ 64-80Vdc	60 @ 30-63Vdc 30 @ 64-80Vdc
Short Circuit Current (RMS amps)	5	10	15	20	25	30	40	50	20	40	60	40	60	20 @ 30-63Vdc 10 @ 64-80Vdc	40 @ 30-63Vdc 20 @ 64-80Vdc
Output Noise*	20 mV rms typical (10kHz to 20MHz) 30dBm (measured without external battery) except for V2000D which is 30 mV rms typical 35 dBm														
Output Rise Time* (min/max)	100/400 (msec) (measured at 10 – 90% of final output level)														
Dynamic Response* (maximum)	3% (change in output voltage within 10 msec after a 10 to 100% load step change)														
Turn On Delay* (max)	3.5 sec (measured from application of valid ac voltage to regulation set-point)														
Adjustable Over-voltage Protection (min/max)	54/60 (Vdc) remotely config.								27/30 (Vdc) remotely config.			13.5/15 (Vdc) remotely config.		30/80 (Vdc) remotely config.	
Backup Over-voltage Protection (max)	60 Vdc								34 Vdc			19 Vdc		88 Vdc	
Load Sharing (min/max)	±10 (%) of full load			±5 (%) of full load											
Reverse Output Current (max)	0.5 amps (internal reverse protection is provided)														
Efficiency	86% typ. @ 230Vac	88% typ. @ 230Vac		92% typ. @ 230Vac					90% typ. @ 230Vac			86% typ. @ 230Vac		88% typ. @ 230Vac	

NOTE: *Compliant to -20°C to +75°C except for V2000D which is -20°C to +50°C and V2500A which is -20°C to +65°C



AUXILIARY OUTPUT SPECIFICATIONS

AUXILIARY OUTPUT	V250A	V0500A	V0750A	V1000A	V1250A	V1500A	V2000A	V2500A	V0500B	V1000B	V1500B	V0500C	V0750C	V2000D
Output 1														
Nominal Voltage	12V													
Vmin/max	10.5 / 14													
Source Current Rating (min/max)	0 / 500mA													
Sink Current** (max)	100mA													

NOTE: Output 1 operates independent of main DC output and is referenced to Vout-

** Current required for internal controls when AC is not present

PHYSICAL SPECIFICATIONS

PARAMETER	V250A	V0500A	V0750A	V1000A	V1250A	V1500A	V2000A	V2500A	V0500B	V1000B	V1500B	V0500C	V0750C	V2000D
Depth	282.9mm (11.14")													
Height	87.6mm (3.45") (includes faceplate)													
Width	86.7mm (3.41") (includes faceplate)													
Weight	3.2kg (7 lbs)													

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	MINIMUM	MAXIMUM	UNIT	NOTES
Storage Temperature	-40	85	°C	
Operating Temperature(internal cooling)	-40	75	°C	All units except V2500A and V2000D run full power across operating temperature range. V2500A operates full power from -40 to +65°C. V2000D operates full power from -40 to +50°C.
Humidity	5	95	%	Relative Humidity Non Condensing
Altitude	-200	8000	Ft	For operation above 8000' , maximum temperature is derated 2°C per 1000' for temps above 65°C

GENERAL REQUIREMENTS

APPLICABLE STANDARDS			
Shock	IEC68-2-27, Mil-STD-810E, 20G	EN61000-3-3	Limits for voltage fluctuations and flicker in low-voltage systems.
Vibration	IEC68-2-64 (random vibration), Frequency Range: 20 - 2000 Hz, Time duration: Minimum of 30 minutes.	EN61000-4-2	Electrostatic discharge immunity test. Level 4. All user accessible ports. Damage free, operational and non-operational. Criterion B.
Seismic Rating	Zone 4, per GR-63-CORE	EN61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test. Level 3: 10 V/m.
Radiated EMI	Conforms to EN55022, Level B.	EN61000-4-4	Electrical fast transient/burst immunity test. Level 4.
Conductive Emissions	EN55022, Level B & FCC Class B	EN61000-4-5	Surge immunity test. Installation Class 4. 6 kV: Line to Line, Criterion A. 6 kV: Line to Ground, Criterion A. RF Common Mode. Level 3, Criterion A.
NEBS	EMC, Surge Standards, and Electrical Safety per GR-1089-CORE.	EN61000-4-6	
IEEE-C62.41	IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits. Category A2.	EN61000-4-8	Magnetic Field. Level 3, Criterion A.
EN61000-3-2	Limits for harmonic current emissions for class D equipment.	EN61000-4-11	Voltage dips, short interruptions and voltage variations.

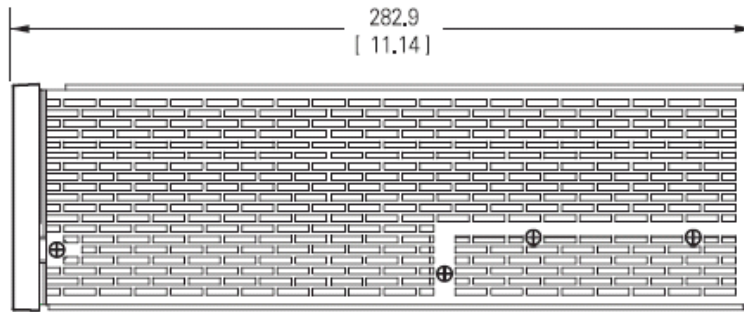
Specifications are subject to change without notice



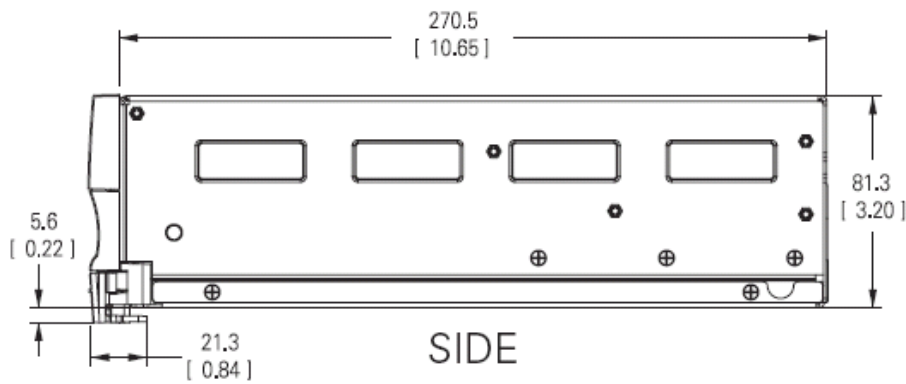
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Dimension drawings

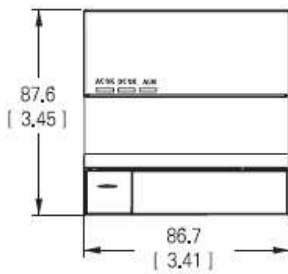
Top View



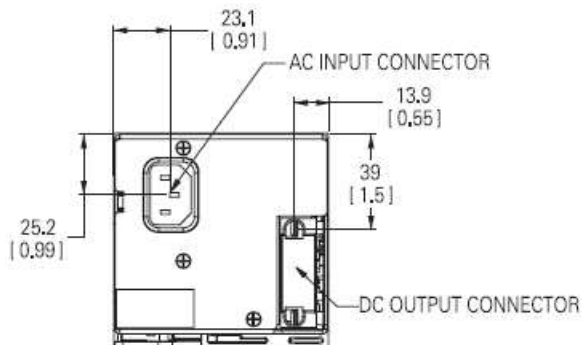
Side View



Front View

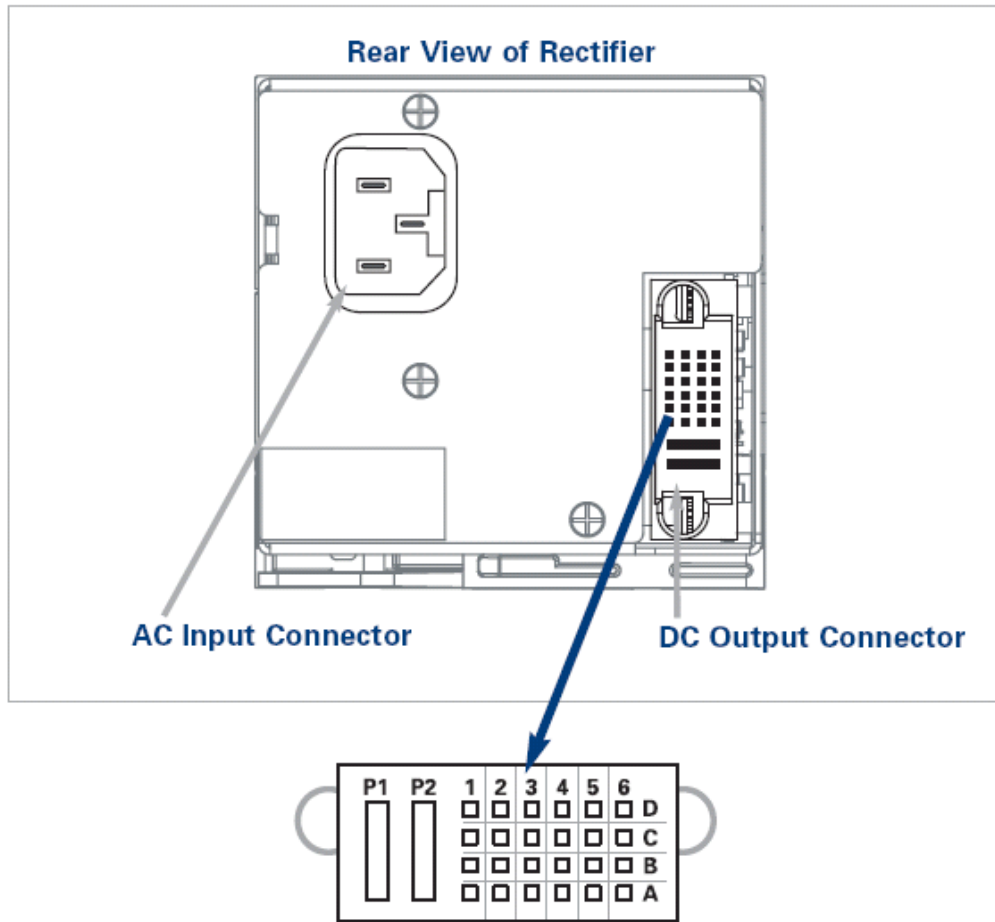


Back View



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Rectifier Connector Pin-out Requirements



Unit Connector p/n: 51732-007
 Mating Connector p/n: 51742-102024
 Supplier: FCI/Berg

FCI NUMBERING	1	2	3	4	5	6
D	REMOTE_SENSE+	MODULE_DISABLE	MODULE_PRESENT	AC_FAIL	LOGIC_GROUND	MODULE_ALARM
C	REMOTE_SENSE-	SHORT_PIN	OPTION	RESERVED	OPTION	SHELF_BIAS
B	OPTION	OPTION	LOC1	OPTION	RESERVED	SCL
A	V_MARGIN	ISHARE	LOC2	LOC0	TEMP	SDA
P1	OUTPUT POSITIVE					
P2	OUTPUT NEGATIVE					

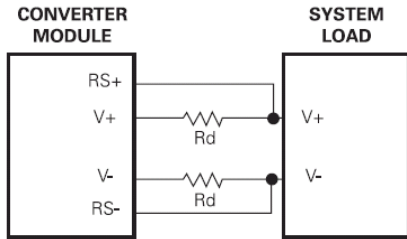
(Signal Description)

OUTPUT+ and OUTPUT-

Power blades used for connecting positive and negative power connections.

REMOTE_SENSE+ and REMOTE_SENSE-

These signals are used to compensate for distribution drop across the output distribution. The maximum voltage drop from the rectifier module to the remote sense connection (the complete round trip) must be maintained to less than 1V.



The remote sense leads may be left un-terminated in applications where remote voltage regulation is not required.

ISHARE

All rectifiers ISHARE pins are tied together on the system backplane to support load sharing. This connection may be terminated between rectifiers or left un-terminated in systems where load share is not required.

SHORT_PIN

The short pin is used to disable the rectifier if not fully seated in a system. It is required to be tied to OUTPUT- in the system backplane in order for the rectifier to provide proper output voltage. It may not be left un-terminated.

I²C Communications Bus (SCL, SDA, LOC0, LOC1, LOC2)

The I²C Communications Bus provides information about internal rectifier conditions as well as full control of output voltage and alarming set-points. SCL and SDA are common data signals and can be wired directly to a system controller or on a common shared bus between the rectifiers in a system and the main system controller.

LOC0, LOC1, and LOC2 are location pins used to set rectifier address in a system where the I²C bus is shared between rectifiers. They may be left un-terminated to generate a logic 1 or connected to OUTPUT- to generate a logic 0.

The I²C Communications Bus signals are logic referenced to OUTPUT-. The Address Scheme is shown.

LOC 0 Logic Level	LOC 1 Logic Level	LOC 2 Logic Level	Rectifier I ² C Position
0	0	0	0x10
0	0	1	0x12
0	1	0	0x14
0	1	1	0x16
1	0	0	0x18
1	0	1	0x1A
1	1	0	0x1C
1	1	1	0x1E

For more information on I²C, refer to the I²C Application Guide.

V_MARGIN

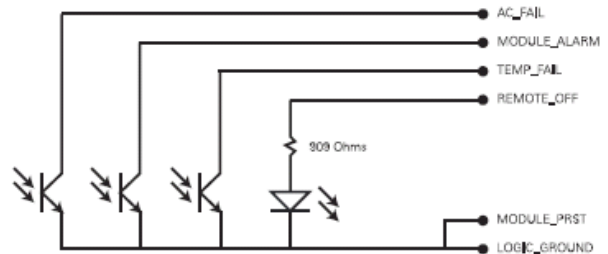
V_Margin is used in systems where analog voltage margining up of the output voltage is required. The rectifier output voltage will default to the I²C setpoint value, which is factory set to 48.0V. Analog margining will then allow a host system to increase the rectifier above this I²C setpoint. It may be left un-terminated in systems where this feature is not required.

INPUT VOLTAGE	RECTIFIER OUTPUT VOLTAGE INCREASE
0V or Un-terminated	0V
5V	10V

SHELF_BIAS

Provides a 12V/500 mA bias for system operation. Shelf bias is a bi-directional signal that can be provided from an external source to power the secondary control circuitry within each rectifier. Shelf bias is internally protected from overload conditions.

ISOLATED INTERFACE SIGNALS



MODULE_PRESENT

This signal is internally connected to LOGIC_GND within each rectifier. It may be used to determine the presence of a rectifier module in a system location.

AC_ALARM

This signal is an opto-isolated open collector signal referenced to LOGIC_GND within each rectifier. AC_ALARM is a normally closed signal which signifies the presence of an alarm with a high impedance. AC_ALARM indicates the presence of valid AC input voltage to the rectifier.

DC_ALARM

This signal is an opto-isolated open collector signal referenced to LOGIC_GND within each rectifier. DC_ALARM is a normally closed signal which signifies the presence of an alarm with a high impedance. DC_ALARM is designed to provide an power fail warning to indicate the pending loss of DC voltage during line drop conditions. DC_ALARM is asserted at least 5mSec prior to loss of DC output voltage during these conditions. DC_ALARM may be asserted during high transient conditions on the rectifier such as 10 to 90% transient conditions.

OVERTEMP_ALARM

This signal is an opto-isolated open collector signal referenced to LOGIC_GND within each rectifier. OVERTEMP_ALARM is a normally closed signal which signifies the presence of an alarm with a high impedance. This alarm indicates that the rectifier module has shutdown due to an over temperature condition.

REMOTE_OFF

This signal is a current limited input designed to accept a 3.3V to 5V input voltage. Applying a voltage between these pins will result in disabling the DC output voltage from the rectifier. This signal may be left un-terminated in systems where MODULE_DISABLE is not required or is implemented via the I²C Interface.

SERIAL EEPROM CONNECTIONS (DO, DIN, VDD3, CS, CLK)

Each rectifier module contains an internal, SPI serial EEPROM. This EEPROM is an Atmel AT93C66 serial EEPROM or equivalent. See the AtmelAT93C66 serial EEPROM datasheet for more information.

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