H-series
Rectifier Module

Overview:

Eltek Valere's H-series rectifier modules provide industry-leading power density and efficiency in a 1 RU footprint. Versatility, scalability, and "hot swap" capability make for optimal system design and cost-effective deployment—from initial install to future upgrades.

Advantages

Optimization
Eltek Valere rectifiers are optimized for the demanding power and efficiency needs of telecommunications equipment.

Small size, big power
H-series rectifiers can provide up to 2500 Watts of power in only 1RU. The small size frees up space to reduce system size or incorporate additional electronics.

Industry leading efficiency
An industry-leading 93% efficiency reduces the thermal load, thus improving the overall reliability and availability of the system.

Flexibility
H-series rectifiers are the power core or Eltek Valere's H-series Mini DC Power Systems. They can operate either with a system controller or as standalone modules in customer equipment.

Features

- Up to 93% efficient
- Small 1RU footprint
- Output voltages from 12V to 48V
- Output power up to 2500W
- Constant current
- Wide-range operating temperature, from -40°C to +70°C (-40°F to 158°F)
- Universal AC input
- Power-factor correction
- Hot-plug/hot-swap capable
- Redundant parallel operation
- Active load sharing
- Advanced internal monitoring
- Front status LEDs
- Internal over-temperature protection
- Internal OR-ing protection
- Internal surge protection
- NEBS, UL/CSA, and VDE certified
- CE Mark for Low Voltage Directive

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Power Specifications

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AC Input Specifications

H SERIES	H0750A1	H1250A1	H1250B1	H1250C1	H2000A1	H2500A1	H2500A2	NOTES
Input Voltage (min)	90 Vac	90 Vac	90 Vac	90 Vac	180 Vac	180 Vac	180 Vac	Startup Voltage. Unit operates to 5V below startup voltage
Input Voltage (max)	264 Vac						300 Vac	Steady State Voltage. Unit with stands short duration excursions to 300Vac.
Input Frequency (min)	47 Hz							
Input Frequency (max)	63 Hz							
Input Current (max)								
@ 120 Vac (amps)	7.9	13.0	13.4	13.5		-	-	
@ 208 Vac (amps)	4.5	7.6	7.5	7.7	12.0	14.6	15.0	
@ 277 Vac (amps)	-	-	-	-	-	-	11.0	
Inrush Current (max)	34 amps peak							Excludes X caps in the EMC input filter.
Power Factor	.99 @ typ. @ 230Vac, full load							

DC Output Specifications

MAIN OUTPUT	H0750A1	H1250A1	H1250B1	H1250C1	H2000A1	H2500A1	H2500A2	NOTES
Vo Set Point (min/typ/max)	42/48/56	42/48/56	21/24/28	10.5/12/14	42/48/56	42/48/56	42/48/56	Volts
Regulation (min/max)	±1%							Total regulation line, load, aging & temperature
Output Current (min/max amps)	0/15	0/25	0/50	0/100	0/40	0/50	0/50	
Output Power (watts max)	840	1400	1400	1400	2240	2800	2800	
Current Limit Setpoint (min/max amps)	5/20	5/30	5/60	10/120	5/48	5/60	5/60	Current limit setpoint is adjustable via I²C or through Eltek Valere NIC.
Short Circuit Current (peak amps)	23	37	75	150	60	75	75	Excluding output capacitor discharge current.
Short Circuit Current (RMS amps)	8	15	25	50	20	25	25	
Output Noise*	○ 20 mV rms typical (10kHz to 20MHz) ○ 30 dBrnc (measured w/o external battery) ○ 250mV P-P (10 Khz to 20 Mhz)							
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 msecs after a 10% to 100% load step change
Turn On Delay* (maximum)	3.5 sec							Measured from application of valid ac voltage to regulation set-point
Adjustable Over-voltage Protection (min/max)	50/60V	50/60V	27/30V	13/15V	50/60V	50/60V	50/60V	Remotely Configured. Adjustable via I²C or through Valere NIC.
Backup Over-voltage Protection (max)	60 Vdc	60 Vdc	32 Vdc	19 Vdc	60 Vdc	60 Vdc	60 Vdc	
Load Sharing (min/max)	±5% of full load							
Reverse Output Current (max)	0.5 amps							Internal reverse protection is provided.
Efficiency	90%	92%	90%	88%	93%	93%	92%	Typical @ 230 Vac

NOTE: *Specification temperature range: -20°C to +50°C

H-series Rectifier Module
Additional Specifications

AUXILIARY OUTPUT SPECIFICATIONS

AUXILIARY OUTPUT	H-series Rectifiers	NOTES
Nominal Voltage	12V	
Vmin/max	10.5 / 14	
Source Current Rating (min/max)	0 / 500mA	
Sink Current (max)	100mA	Current required for internal controls when AC is not present

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

PHYSICAL SPECIFICATIONS

PARAMETER	H-series Rectifiers	NOTES
Depth	361.9mm (14.25")	
Height	41.3mm (1.63") (chassis), 42.9mm (1.69") (faceplate)	
Width	101.7mm (4.00")	
Weight	2.7kg (6lbs)	

ENVIRONMENTAL SPECIFICATIONS

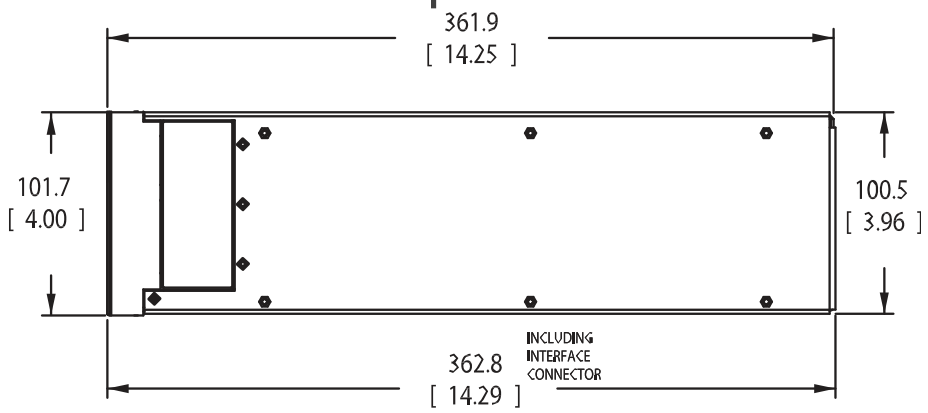
PARAMETER	Minimum	Maximum	UNIT	NOTES
Storage Temperature	-40	85	°C	
Operating Temperature	-40	70	°C	Full power -40°C to +50°C; output power derates 2%/°C above 50°C.
Humidity	5	95	%	Relative Humidity Non Condensing
Altitude	-200	8000	Ft	For operation above 8000' , maximum temperature is derated 2°C per 1000'

GENERAL REQUIRMENTS

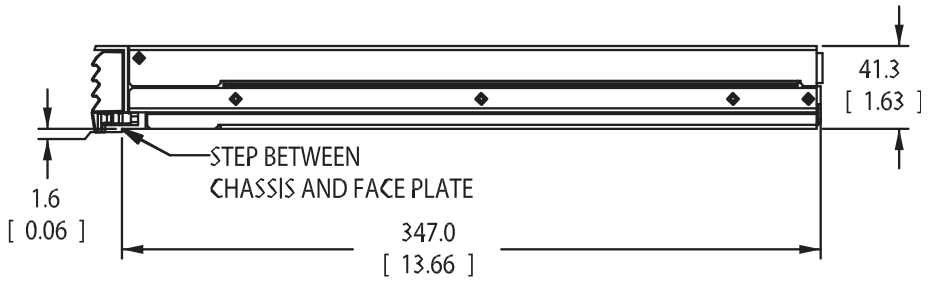
APPLICABLE STANDARDS			
NEBS Level 3	EMC, surge standards, and electrical safety per GR-1089-CORE Seismic rating Zone 4, per GR-63-CORE	EN61000-4-4	Electrical fast transient/burst immunity test. Level 4.
EN55022 Level B	Radiated EMI Conducted Emissions	EN61000-4-5	Surge immunity test. Installation Class 4. 6 kV: Line to Line, Criterion A. 6 kV: Line to Ground, Criterion A.
EN61000-3-2	Limits for harmonic current emissions for class D equipment.	EN61000-4-6	RF Common Mode. Level 3, Criterion A.
EN61000-3-3	Limits for voltage fluctuations and flicker in low-voltage systems.	EN61000-4-8	Magnetic Field. Level 3, Criterion A.
EN61000-4-2	Electrostatic discharge immunity test. Level 4. All user accessible ports. Damage free, operational and non-operational. Criterion B.	EN61000-4-11	Voltage dips, short interruptions and voltage variations.
EN61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test. Level 3: 10 V/m.		

Typical specifications, unless otherwise stated
Nominal line: 230 VAC
Nominal setpoints: 54/27/12 VDC (for 48V/24V/12V rectifiers, respectively)
Nominal load: 100% of rated current
Specifications are subject to change without notice

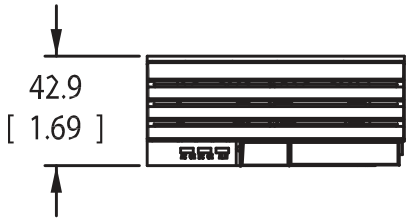
Top View



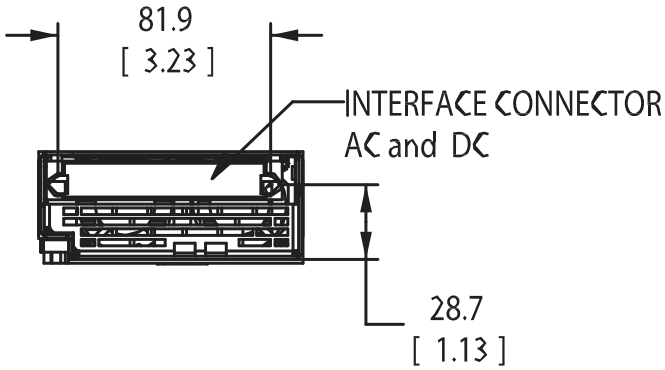
Side View



Front View



Back View



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Rectifier Connector Pin-out Requirements

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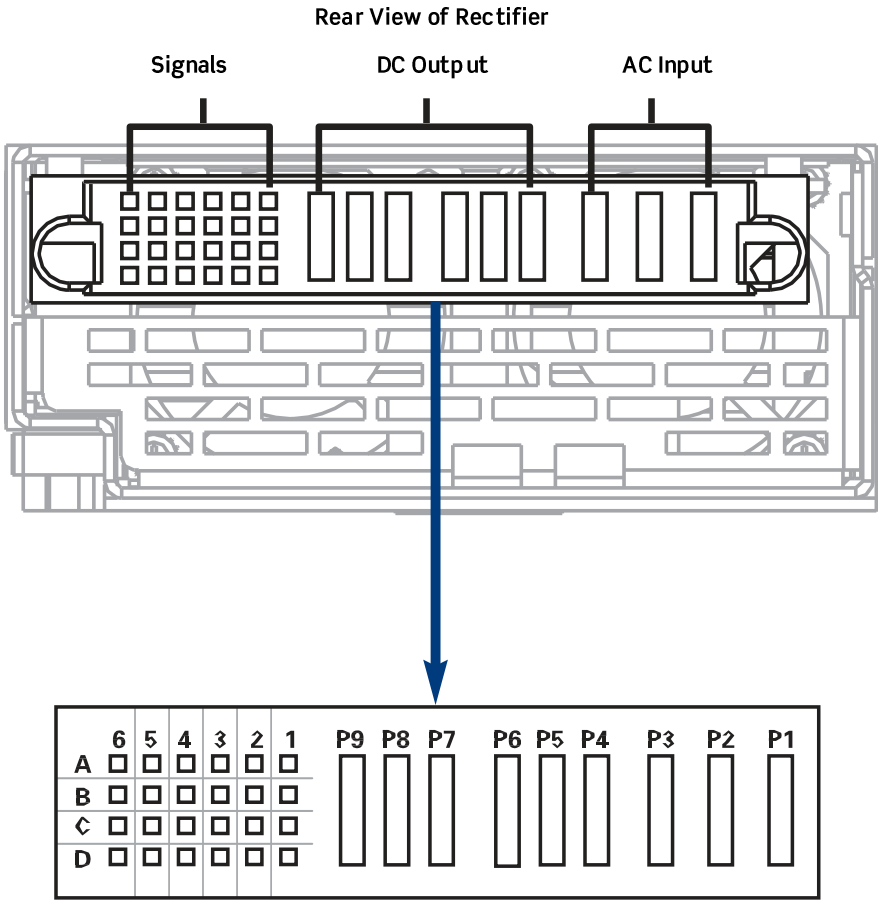


Unit Connector p/n: 51939-140LF
Mating Connector p/n: 51866-025LF
Supplier: FCI/BERG

FCI NUMBERING	6	5	4	3	2	1
A	LOGIC_GROUND	AC_FAIL	OPEN	LOC1	SCL	ISHARE
B	MODULE_ALARM	MODULE_PRST_OUT	OPEN	LOC0	RESERVED	REMOTE_SENSE-
C	MODULE_DISABLE	MODULE_PRST_IN	RESERVED	AUX_OUTPUT_1	V_MARGIN	SECONDARY_RETURN
D	TEMP_ALARM	OPEN	LOC2	SDA	SHORT_PIN	REMOTE_SENSE+
P9	OUTPUT POSITIVE					
P8						
P7						
P6	OUTPUT RETURN					
P5						
P4						
P3	CHASIS GROUND					
P2	AC LINE 1					
P1	AC LINE 2					

Non-Isolated Signals

OUTPUT+ and OUTPUT-

These connectors accept power blades for positive and negative power connections.

REMOTE_SENSE+ and REMOTE_SENSE-

These signals are used to compensate for voltage drop across the output distribution. The maximum drop from the rectifier module to the remote sense connection (the complete round trip) must be less than 1V. The remote sense leads may be left un-terminated in applications where remote voltage regulation is not required.

ISHARE

All rectifier 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 it is not fully seated in the slot. It is must be tied to OUTPUT- in the shelf backplane in order for the rectifier to provide proper output voltage. The pin must be terminated.

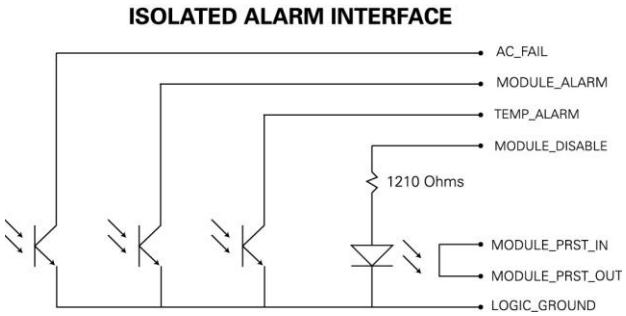
Address Pins (LOC0, LOC1, LOC2)

LOC0, LOC1, and LOC2 are location pins used to set rectifier address in a system where the I^2C bus is shared between rectifiers. They may be left un-terminated to generate logic 1 or connected to OUTPUT- to generate logic 0.

I^2C Communications Bus (SCL, SDA)

The I^2C Communications Bus provides information about internal rectifier conditions as well as full control of output voltage and alarming setpoints. 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. The rectifiers communicate via the proprietary Eltek Valere Communication Protocol. Contact your Eltek Valere representative for technical assistance in interfacing to the rectifiers using this interface protocol. The I^2C Bus signals are logic referenced to OUTPUT-.

Isolated Signals



AC_FAIL

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

MODULE_ALARM

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

TEMP_ALARM

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

MODULE_DISABLE

This signal is a current limited input designed to accept a 3.3V to 5V input voltage. Applying this voltage results 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 I^2C Interface.

MODULE_PRESENT_IN/OUT

This is a general-purpose, configurable signal interface used to detect module presence.

Headquarters:
Eltek Valere
1303 E. Arapaho Rd. Richardson, TX. 75081, USA
Phone: +1 (469) 330-9100 Fax: +1 (469) 330-2955