



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 provide optimal and cost effective solutions for your power needs.

## THE VALERE DIFFERENCE

**Optimization** – Valere Power rectifiers are optimized for the demanding power needs of wireless communications, enterprise and broadband access equipment.

**SMALL SIZE, BIG POWER** – These compact 1RU rectifiers can provide up to 2000 Watts of power. The small size frees 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 overall reliability and availability of the system.

**Flexibility** – These rectifiers are designed to operate as an integral component in Valere’s Enterprise DC Power Systems. They are extremely flexible and can be operated either with a system controller or as a stand-alone module in enterprise applications.

## FEATURES

- Small 1RU Footprint
- Output Voltages from 12V to 48V
- Output Power up to 2000W
- Typical efficiency over 92%
- Wide Range Operating Temperature from -40°C to +70°C
- Universal AC Input
- Power-factor Correction
- Hot-Pluggable
- Redundant Parallel Operation
- Active Load Sharing
- NEBS Level 3 Certified
- UL60950 Recognized
- CSA C22.2 No. 60950-00 Certified
- VDE EN60950 Certified
- Advanced Internal Monitoring

## INPUT SPECIFICATIONS

H SERIES	H1250A1	H1250B1	H1200C1	H2000A1	NOTES
Input Voltage (min)	90Vac			180Vac	Startup Voltage. Unit operates to 5V below startup voltage
Input Voltage (max)	264Vac				Steady State Voltage. Unit withstands short duration excursions to 300Vac.
Input Frequency (min)	47Hz				
Input Frequency (max)	63Hz				
Input Current (max)					
@ 100 Vac (amps)	16	16.4	15.4	-	
@ 120 Vac (amps)	13	13.4	12.5	-	
@ 180 Vac (amps)	8.8	9.0	8.3	13.8	
@ 208 Vac (amps)	7.6	7.8	7.2	12.0	
Inrush Current (max)	30 amps peak				Excludes Xcaps in the EMC input filter.
Power Factor	.99 @ typ. @ 230Vac, full load				

## OUTPUT SPECIFICATIONS

MAIN OUTPUTS	H1250A1	H1250B1	H1200C1	H2000A1	NOTES
Vo Set Point (min/typ/max)	42/48/56V	21/24/28V	10.5/12/14V	42/48/58V	
Regulation (min/max)	±1%				Total regulation line, load, aging & temperature
Output Current (min/max amps)	0/25	0/50	0/100	0/40	
Output Power (watts max)	1250	1250	1200	2000	
Current Limit Setpoint (min/max amps)	5/30	5/60	10/120	5/48	Current limit setpoint is adjustable via I <sup>2</sup> C or through Valere Network Interface Card.
Short Circuit Current (Peak amps)	37	90	150	60	Unit will shut down within 5 sec. and will restart if short circuit is removed.
Short Circuit Current (RMS amps)	15	30	50	20	
Output Noise*	20 mV rms typical (10kHz to 20MHz) 30 dBrc (measured without 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)	4 sec				Measured from application of valid ac voltage to regulation set-point.
Adjustable Over-voltage Protection (min/max)	50/60V remotely config.	27/30V remotely config.	13/15V remotely config.	50/60V remotely config.	Adjustable via I <sup>2</sup> C or through Valere Network Interface Card.
Backup Over-voltage Protection (max)	60Vdc	32Vdc	19Vdc	60Vdc	
Load Sharing (min/max)	±5 (%) of full load				
Reverse Output Current (max)	0.5 amps				Internal reverse protection is provided.
Efficiency	92% @ full load	90% @ full load	86% @ full load	92% @ full load	Typical @ 230Vac

NOTE: \*Operating temperature range: -20°C to +70°C

## OUTPUT SPECIFICATIONS cont.

AUXILIARY OUTPUTS	H1250A1	H1250B1	H1200C1	H2000A1	NOTES
Output 1					
Nominal Voltage		12V			
Vmin/max		10.5 / 14			
Source Current Rating (min/max)		0 / 600mA			
Sink Current (max)		100mA			Current required for internal controls when AC is not present
Output 2					
Nominal Voltage		5V			
Vmin/max		4.5 / 5.5			
Current Rating (min/max)		0 / 1A			

NOTE: Output 1 and Output 2 operate independant of main DC output and are referenced to Vout-

## PHYSICAL SPECIFICATIONS

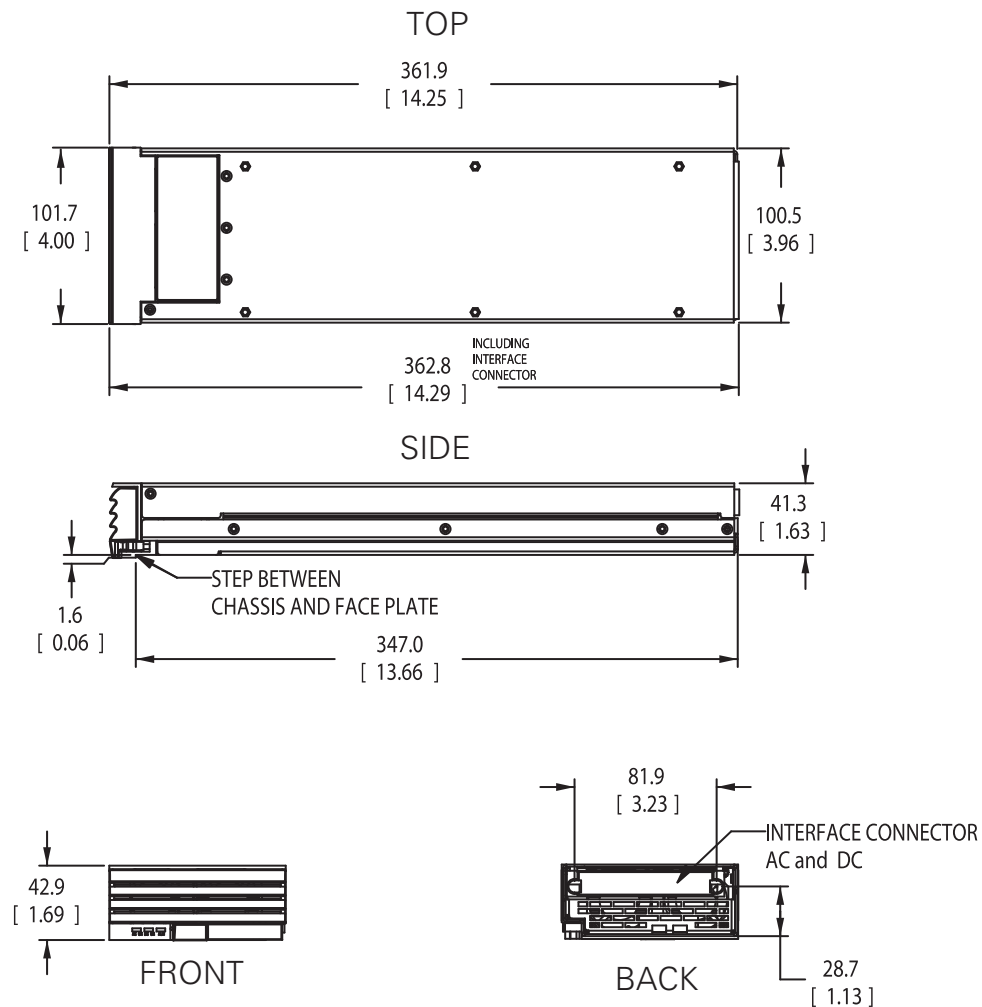
### H Series

- Depth: 14.3"
- Width: 4.0"
- Height: 1.6" (chassis), 1.7" (faceplate)
- Weight: 6 lbs

### 19" Shelf Dimensions

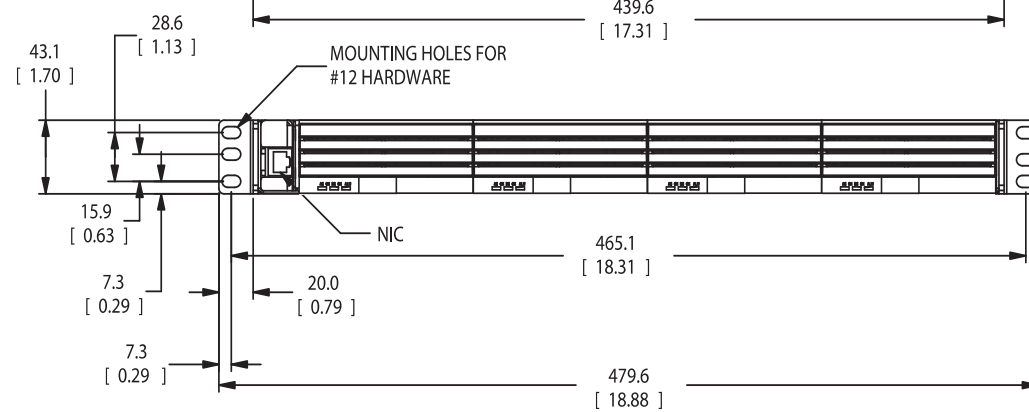
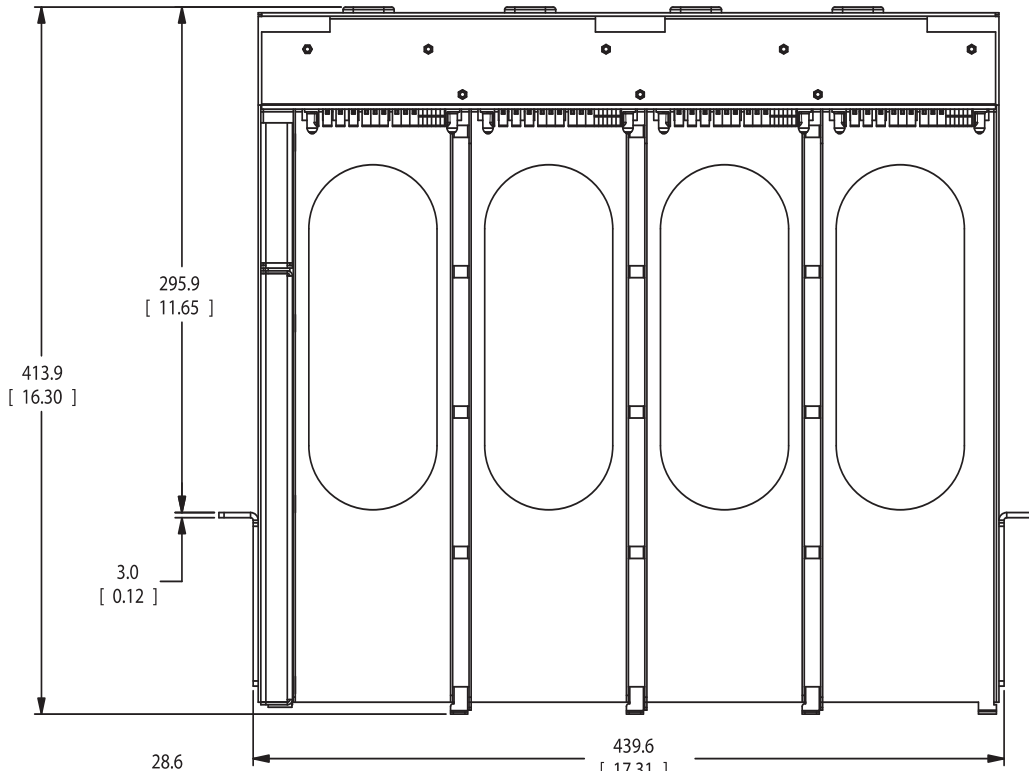
- Depth: 16.3"
- Height: 1.7"
- Width: 17.3" (accommodates up to four rectifiers)
- Weight: 9 lbs

## RECTIFIER DIMENSIONAL DRAWINGS



# 19" SHELF DIMENSIONAL DRAWINGS

TOP



## NETWORK INTERFACE CARD FEATURES

### Operating Voltage

- 12V (operates from BIAS Aux Output 1 only)

### Operating Current

- 500mA max

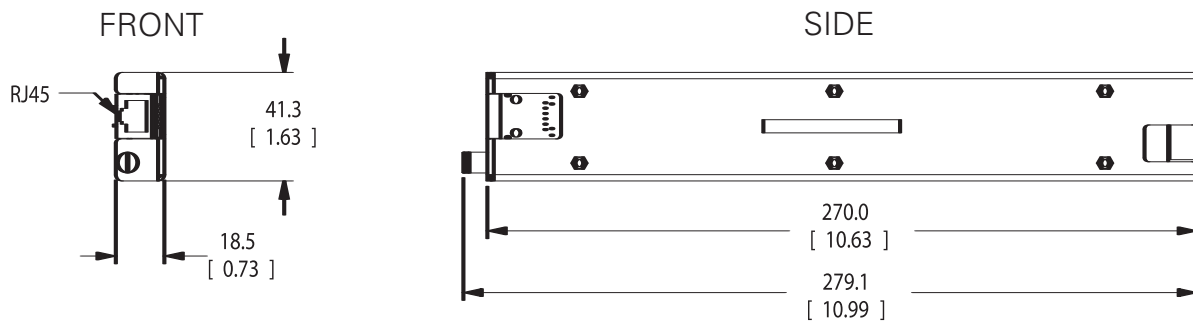
### Interface Connection

- RJ45

### Interface

- 10/100 LAN
- Webserver
- TELNET
- SNMP

## NETWORK INTERFACE CARD DIMENSIONAL DRAWINGS



## ENVIRONMENTAL CHARACTERISTICS

PARAMETER	Min	Max	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 REQUIREMENTS

### **Shock**

IEC68-2-27, Mil-STD-810E, 20G

### **Vibration**

IEC68-2-64 (random vibration), Frequency Range: 20 - 2000 Hz,  
Time duration: Minimum of 30 minutes.

### **Seismic Rating**

Zone 4, per GR-63-CORE.

### **Radiated EMI**

Conforms to EN55022, Level B.

### **Conductive Emissions**

EN55022, Level B & FCC Class B

### **NEBS**

EMC, Surge Standards, and Electrical Safety per GR-1089-CORE.

### **IEEE-C62.41**

IEEE Recommended Practice on Surge Voltages in Low-Voltage AC  
Power Circuits. Category A2.

### **EN61000-3-2**

Limits for harmonic current emissions for class D equipment.

### **EN61000-3-3**

Limits for voltage fluctuations and flicker in low-voltage systems.

### **EN61000-4-2**

Electrostatic discharge immunity test. Level 4. All user accessible ports.  
Damage free, operational and non-operational. Criterion B.

### **EN61000-4-3**

Radiated, radio-frequency, electromagnetic field immunity test.  
Level 3: 10 V/m.

### **EN61000-4-4**

Electrical fast transient/burst immunity test.  
Level 4

### **EN61000-4-5**

Surge immunity test. Installation Class 4.  
6 kV: Line to Line, Criterion A.  
6 kV: Line to Ground, Criterion A.

### **EN61000-4-6**

RF Common Mode. Level 3, Criterion A.

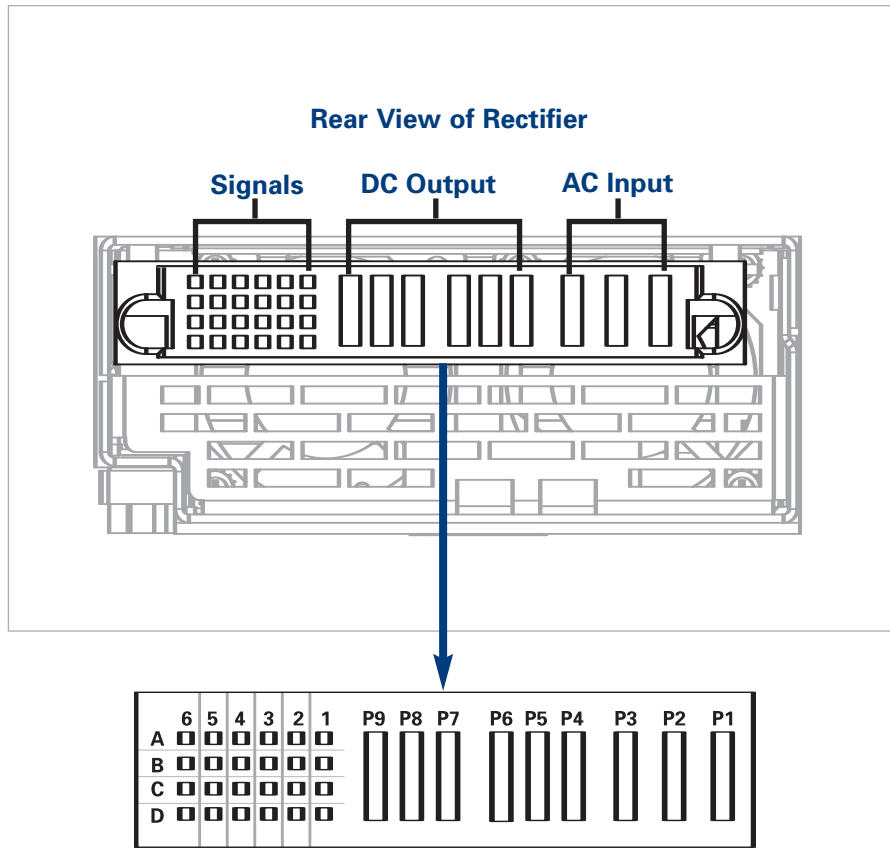
### **EN61000-4-8**

Magnetic Field. Level 3, Criterion A.

### **EN61000-4-11**

Voltage dips, short interruptions and voltage variations.

# RECTIFIER CONNECTOR PINOUT REQUIREMENT



FCI NUMBERING	D	C	B	A
<b>6</b>	TEMP_ALARM	MODULE_DISABLE	MODULE_ALARM	LOGIC_GROUND
<b>5</b>	OPEN	MODULE_PRST_IN	MODULE_PRST_OUT	AC_FAIL
<b>4</b>	LOC2	AUX_OUTPUT_2	OPEN	OPEN
<b>3</b>	SDA	AUX_OUTPUT_1	LOC0	LOC1
<b>2</b>	SHORT_PIN	V_MARGIN	RESERVED	SCL
<b>1</b>	REMOTE_SENSE+	SECONDARY_RETURN	REMOTE_SENSE-	ISHARE
<b>P9</b>	OUTPUT POSITIVE			
<b>P8</b>				
<b>P7</b>				
<b>P6</b>	OUTPUT RETURN			
<b>P5</b>				
<b>P4</b>				
<b>P3</b>	CHASSIS GROUND			
<b>P2</b>	AC LINE 1			
<b>P1</b>	AC LINE 2			

## SIGNAL DESCRIPTION

### Non-Isolated Signals

#### OUTPUT+ and OUTPUT-

Power blades are used for connecting positive and negative power connections.

#### PRECHARGE

Precharge allows for rapid charging of the DC output capacitors during hot insertion. It must be tied to OUTPUT+ in the system shelf.

#### 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.

#### 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 default 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

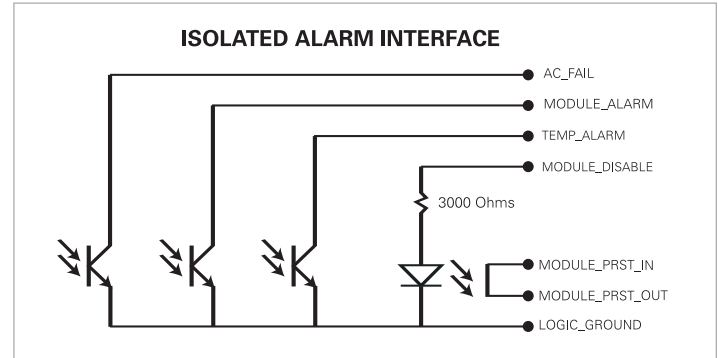
#### ADDRESS PINS (LOC01, LOC02, LOC03)

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 logic 1 or connected to OUTPUT- to generate logic 0.

### Isolated Signals

#### I2C COMMUNICATIONS BUS (SCL, SDA)

The I2C 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 Valere Communication Protocol. Contact your Valere Power representative for technical assistance in interfacing to the rectifiers using this interface protocol. The I2C Bus signals are logic referenced to OUTPUT-



#### MODULE\_PRESENT

This signal is a connection to logic ground. 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.

#### 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.

#### 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. OVERTEMP\_ALARM indicates that the rectifier module has shut down due to an overtemperature 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 I2C Interface.