VALERE POWER

H SERIES RECTIFIERS

DATA SHEET

THE POWER TO INNOVATE

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 2500 Watts of power. 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 – 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 2500W
- Typical efficiency 93%
- 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	H0500A1	H0750A1	H1000A1	H1250A1	H1500A1	H2000A1	H2500A1	H1250B1	H0750C1	H1250C1	NOTES
Input Voltage (min)	90 Vac	90 Vac	90 Vac	90 Vac	180 Vac	180 Vac	180 Vac	90 Vac	90 Vac	90 Vac	Startup Voltage.Unit operates to 5V below startup voltage
Input Voltage (max)	264 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)											
@ 100 Vac (amps)	6.6	9.7	12.8	16	-	-	-	16.4	10.5	16.6	
@ 120 Vac (amps)	5.4	7.9	10.5	13	-	-	-	13.4	8.5	13.5	
@ 180 Vac (amps)	3.5	5.2	6.9	8.8	10.3	13.8	16.9	8.7	5.6	8.9	
@ 208 Vac (amps)	3.0	4.5	5.9	7.6	8.8	12.0	14.6	7.5	4.8	7.7	
Inrush Current (max)	30 amps peak										Excludes Xcaps in the EMC input filter.
Power Factor	.99 @ typ. @ 230Vac, full load										

OUTPUT SPECIFICATIONS

MAIN OUTPUT	H0500A1	H0750A1	H1000A1	H1250A1	H1500A1	H2000A1	H2500A1	H1250B1	H0750C1	H1250C1	NOTES
Vo Set Point (min/typ/max)	42/48/56	42/48/56	42/48/56	42/48/56	42/48/56	42/48/56	42/48/56	21/24/28	10.5/12/14	10.5/12/14	Volts
Regulation (min/max)	±1 (%)										Total regulation line, load, aging & temperature
Output Current (min/max amps)	0/10	0/15	0/20	0/25	0/30	0/40	0/50	0/50	0/60	0/100	
Output Power (watts max)	500	750	1000	1250	1500	2000	2500	1250	750	1250	
Current Limit Setpoint (min/max amps)	5/15	5/20	5/25	5/30	5/35	5/48	5/60	5/60	5/72	10/120	Current limit setpoint is adjustable via I²C or through Valere NIC.
Short Circuit Current (peak amps)	15	23	30	37	45	60	75	75	90	150	Excluding output capacitor discharge current.
Short Circuit Current (RMS amps)	5	8	10	15	15	20	25	25	30	50	
Output Noise*	20 mV rms typical (10kHz to 20MHz) 30 dBrnc (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* (max)	3.5 sec										Measured from application of valid ac voltage to regulation set-point
Adjustable Over-voltage Protection (min/max)	50/60V	50/60V	50/60V	50/60V	50/60V	50/60V	50/60V	27/30V	13/15V	13/15V	Remotely Configured. Adjustable via I²C or through Valere NIC.
Backup Over-voltage Protection (max)	60 Vdc	60 Vdc	60 Vdc	60 Vdc	60 Vdc	60 Vdc	60 Vdc	32 Vdc	19 Vdc	19 Vdc	
Load Sharing (min/max)	±5 (%) of full load										
Reverse Output Current (max)	0.5 amps										Internal reverse protection is provided.
Efficiency	89%	90%	91%	92%	92%	93%	93%	90%	87%	88%	Typical @ 230 Vac

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

OUTPUT SPECIFICATIONS cont.

AUXILIARY OUTPUT	H0500A1	H0750A1	H1000A1	H1250A1	H1500A1	H2000A1	H2500A1	H1250B1	H0750C1	H1250C1	NOTES
Output 1											
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

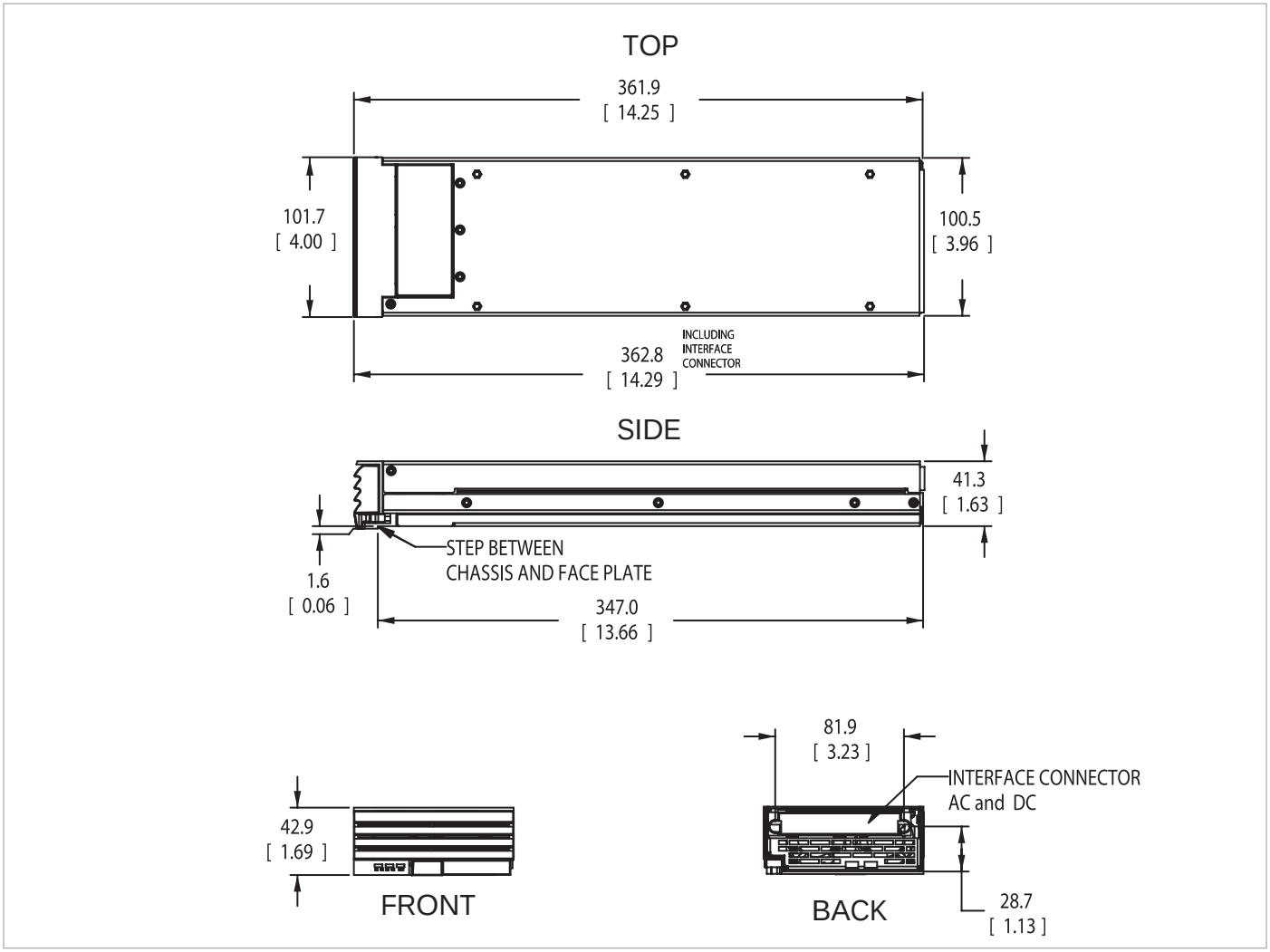
H Series

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

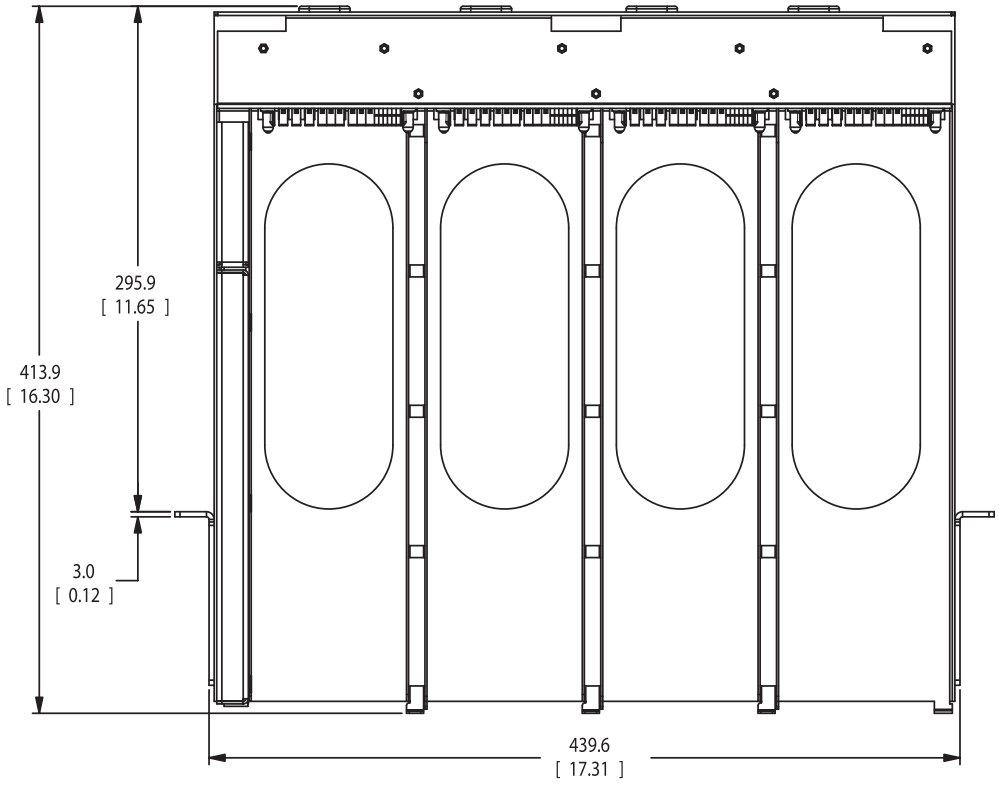
482.6mm (19") Shelf Dimensions

- Depth: 413.9mm (16.30")
- Height: 43.1mm (1.70")
- Width: 439.6mm (17.31") (accommodates up to four rectifiers)
- Weight: 4.1kg (9lbs)

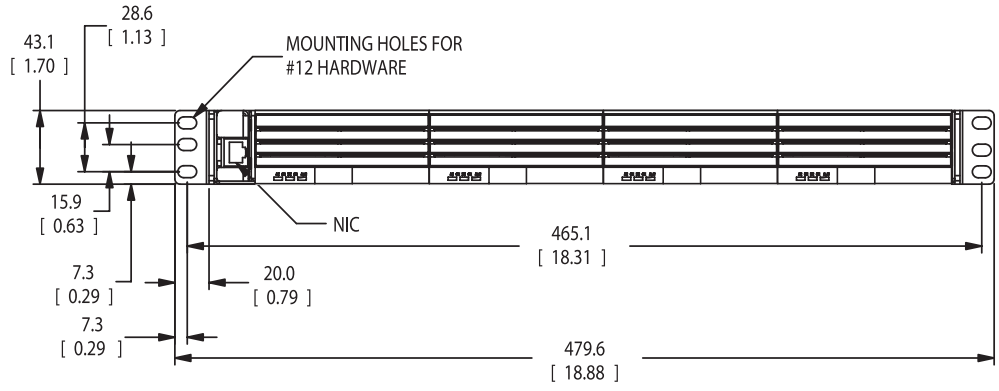
RECTIFIER DIMENSIONAL DRAWINGS



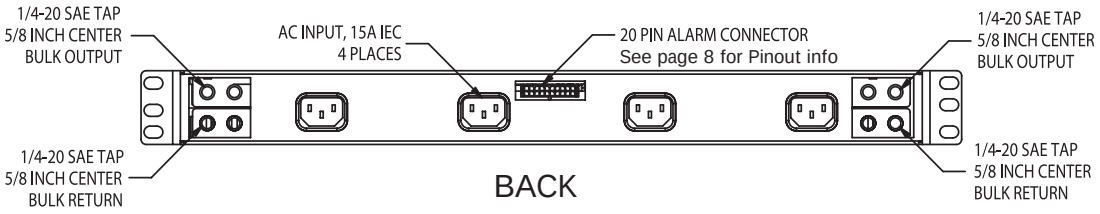
482.6mm (19") SHELF DIMENSIONAL DRAWINGS



TOP



FRONT



BACK

NOTE: This is a representative shelf. Contact your sales representative for custom configurations.

NETWORK INTERFACE CARD FEATURES

Operating Voltage

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

Operating Current

- 500mA max

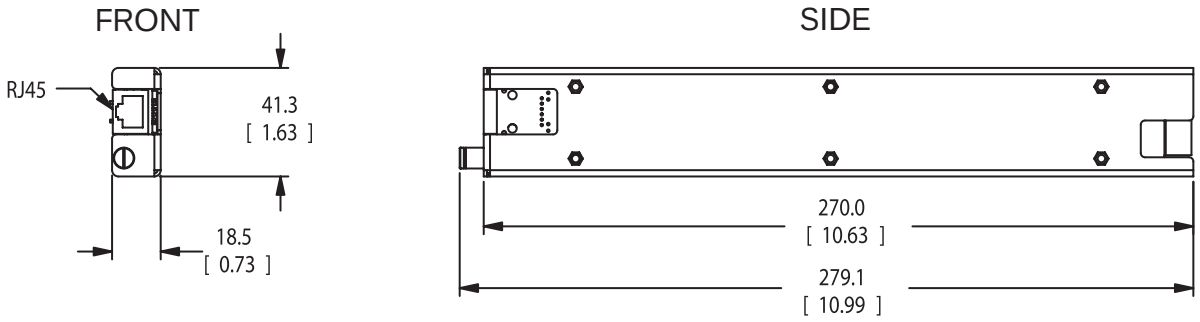
Interface Connection

- 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

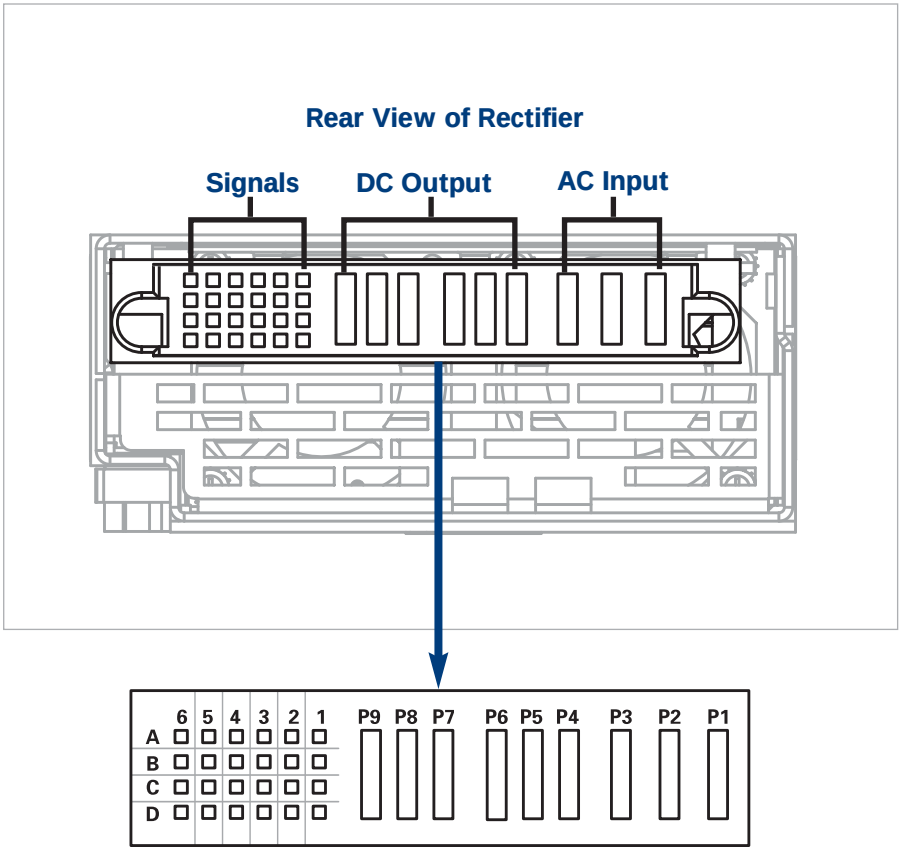
EN61000-4-5
Surge immunity test. Installation Class 4.
6 kV: Line to Line, Criterion A.
6 kV: Line to Ground, Criterion A.

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



Unit Connector P/N: 51939-103
Mating Connector P/N: 51866-025
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	CHASSIS GROUND					
P2	AC LINE 1					
P1	AC LINE 2					

RECTIFIER SIGNAL DESCRIPTION

Non-Isolated Signals

OUTPUT+ and OUTPUT–

Power blades uses 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.

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 the nominal outoutput of the specific rectifier (see table on page 2). 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

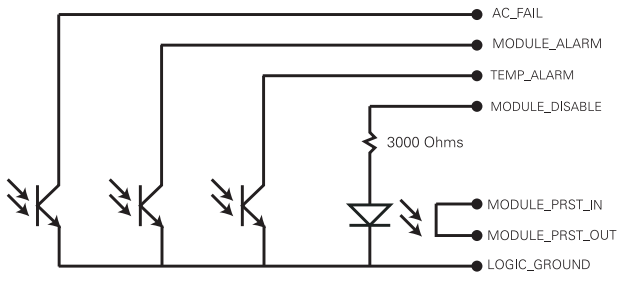
ADDRESS PINS (LOC0, LOC1, LOC2)

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.

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-.

ISOLATED ALARM INTERFACE



Isolated Signals

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 an 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.

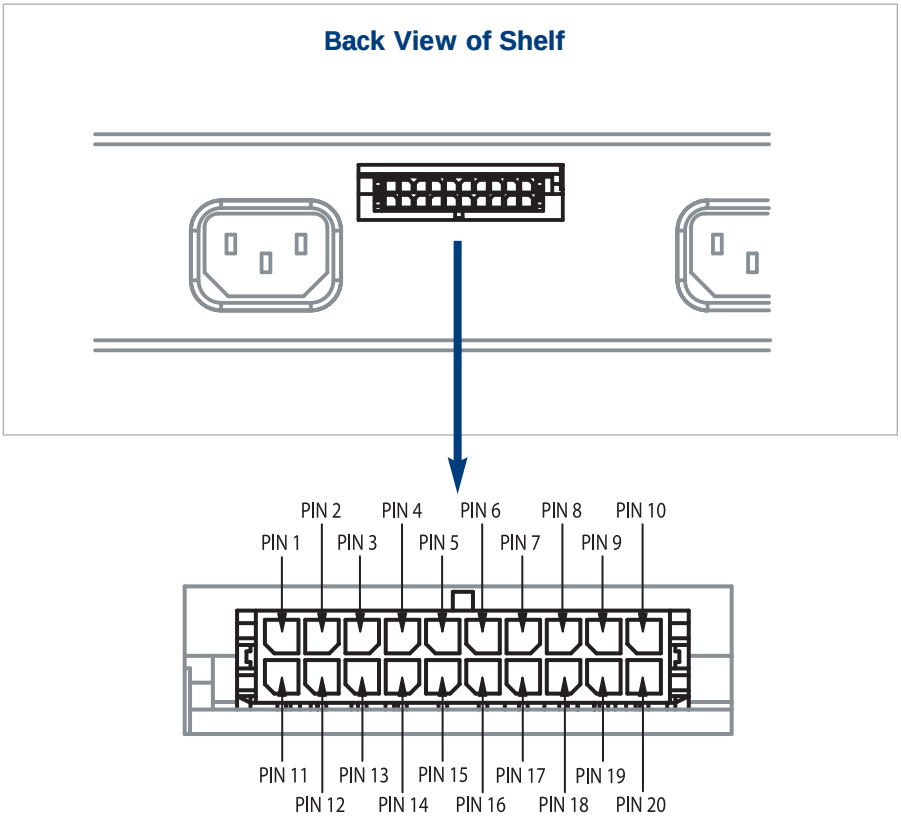
OVERTEMP_ALARM

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 unterminated in systems where MODULE_DISABLE is not required or is implemented via the I2C Interface.

SHELF INTERFACE CONNECTOR PINOUT REQUIREMENT



PIN LOCATION		PIN LOCATION	
1	SHELF_BIAS_12V	11	POWER_GRND
2	SCL	12	RESERVED
3	SDA	13	V_MARGIN
4	LOGIC_GRND	14	RESERVED
5	MODULE_DISABLE	15	THERMAL_ALARM
6	MODULE_AC FAIL_0	16	MODULE_ALARM_0
7	MODULE_AC FAIL_1	17	MODULE_ALARM_1
8	MODULE_AC FAIL_2	18	MODULE_ALARM_2
9	MODULE_AC FAIL_3	19	MODULE_ALARM_3
10	OPEN	20	MODULE_PRESENT

SHELF SIGNAL DESCRIPTION

Non-Isolated Signals

SHELF_BIAS_12V

A non regulated nominal 12V output available from each rectifier is OR'ed together for general purpose use. This output is referenced to POWER_GRND (Pin 11). Each installed rectifier is capable of sourcing 100mA of current to a source through this output.

SCL

The clock line for I2C interface to any rectifier(s) in the shelf. This signal is referenced to POWER_GRND (Pin11)

SDA

The data line for I2C interface to any rectifier(s) in the shelf. This signal is referenced to POWER_GRND (Pin11)

POWER_GRND

System power ground, which is tied to the negative output of the rectifier.

V_MARGIN

Margin input to all rectifiers in the shelf. V_Margin is used in systems where analog voltage margining up of the output voltage is required.

Isolated Signals

LOGIC_GRND

An isolated ground for optically isolated alarm outputs and inhibition input signal to all rectifiers. This logic ground can be tied to any customer defined ground potential.

MODULE_DISABLE

The module disable input of all four rectifiers in the shelf is tied together. If this pin is raised to a logic level of 3.3V or 5V, with respect to the LOGIC_GRND (Pin 4), all rectifier output will be inhibited.

MODULE_AC_FAIL_0, MODULE_AC_FAIL_1, MODULE_AC_FAIL_2, MODULE_AC_FAIL_3

Individual AC FAIL signal from rectifier slot 0 (left most rectifier in system) through slot 3 (right most rectifier in system). These signals are referenced to LOGIC_GRND (Pin 4).

THERMAL_ALARM

This is a combined (OR'ed) alarm from each rectifier OVERTEMP_ALARM output, which is referenced to LOGIC_GRND (Pin 4).

MODULE_ALARM_0, MODULE_ ALARM _1, MODULE_ ALARM _2, MODULE_ ALARM _3

Individual DC FAIL signal from rectifier slot 0 (left most rectifier in system) through slot 3 (right most rectifier in system). These signals are referenced to LOGIC_GRND (Pin 4).

MODULE PRESENT

This pin is tied to LOGIC_GRND (Pin 4), when all four slots in the shelf are present. When one or more rectifiers are removed, from their corresponding slot(s), the pin is isolated from the LOGIC_GRND (Pin 4).

Valere Power Headquarters • 661 N. Plano Rd. Suite 300 • Richardson, Texas 75081 • Toll Free: 1-877-VALERE1 • Phone: 469-330-9100 • Fax: 469-330-2955
CALA Sales Office • 703 Aster Way • Weston, Florida 33327 • Phone: 954-349-0652 • Fax: 469-330-2955
European Sales Office • Manskarsvagen 9, SE-141 75 Kungens Kurva • Sweden • Phone: +46 8 505 26 581 • Fax: +46 8 505 26 580
China Sales Office • Beijing Silver Tower , Office Room 2505 • 2# North Road, Dong San Huan, Chao Yang District • Beijing, China 100027 • Phone: +86 10 6410 7480 / 7481 • Fax: +86 10 6410 7479
South Asia / India Sales Office • # 405, Galleria Towers, DLF City, Phase IV • Gurgaon 122 002 India • Phone: +91 124 5102268-69 • Fax: +91 124 5102257