OmniOn POWER

Integritas™ IR100ACR024ATEZ Rectifier

Uncompromised advanced power

The OmniOn IR100ACR024 rectifier module is designed to efficiently transform single phase AC power into 24 volt DC power using advanced switch mode rectification technology. All Integritas rectifier modules are modular in design, allowing for addition modules to be paralleled together when more power output is needed. This results in ultimate flexibility to add more power without the need to redesign the entire power solution. When efficient, reliable, uncompromised DC power is needed look to this proven leader to meet your critical power needs.

Feature and Advantages

- Compact – 1RU form factor provides high power density 24 Watts/cubic inch.

- High density power package - up to 2725 W.

- Efficient – Peak efficiency of 95.6% occurs at 50% load matching ideal needs for customer use patterns.

- Flexibly provides up to 100 Amps at 24 VDC.

- Adjustable output range between 22-29 VDC.

- Modular design allows for combining multiple rectifiers together to match overall power requirements.

- When paired with a master controller, multiple units run together using load sharing algorithm.

- Self-sustaining - built-in microcontroller keeps unit operational in the event of loss of master controller to eliminate single point of failure.

- Capable of N+1 to N+N redundancy when combined together into a complete power solution.

- Designed to work with Integritas DC power system solutions - a complete power package.

- Operates over a broad temperature range (–40°C through +55°C).

- Starts and runs at any AC voltage from 95 to 305 VAC.

- Fail safe performance – hot insertion capabilities allow for rectifier replacement without system shutdown; soft start and inrush current protection prevent nuisance tripping of upstream breakers.

- Extended service life – parallel operation with automatic load sharing ensures that units are not unduly stressed.

- Compliant to RoHS Directive 2011/65/EU and amended Directive (EU) 2015/863.

- Compliant to REACH Directive (EC) No 1907/2006.

- UL and CE compliant.

IR100ACR024ATEZ_DS Rev. 1.0

Specifications

Inputs

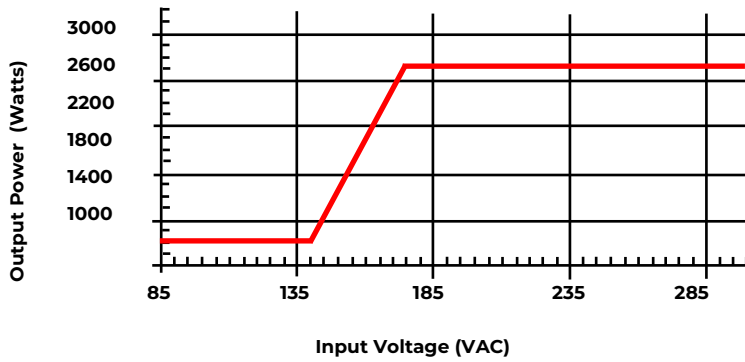|	
Voltage (VAC), 1Φ	90 - 140 (low); 175 - 305 (high) Output power follows a linear path between defined points. 300V max excursion voltage.
Current Draw (A)	15 max @ 120 VAC (low); 16 to 10.5 @ 200-277 VAC (high)
Inrush Current	<18A after narrow EMI capacitor peak
Power Factor	0.98 @ loads over 50%
THD	< 5% @ loads over 50%
Holdover	15 milliseconds with V_{out} >21 V
Frequency (Hz)	45 to 66

Outputs

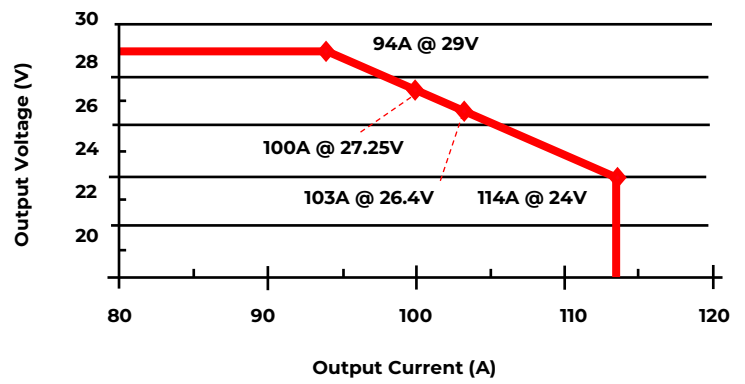|	
Voltage (VDC)	22 – 29 Default = 27.3
Current (A)	44 (low); 100 (high)
Power (W)	1200 (low input <140 VAC); 2725 (high input >175 VAC)
Regulation	FEL 0.05% w/controller; 2% over life load and temperature
Dynamic Response	20 to 80% load step settles to less than 1% in 5 ms
Ripple (mV $_{rms}$)	100
Noise (dB $_{rnc}$)	<55
Efficiency	95.6% peak
Start Up	Start up is monotonic
Soft Start	Starts up into fully discharged batteries
Walk In	Current walk in over 8 to 10 seconds, can be disabled
Overload Shutdown	Shuts down with no damage when presented with a 15 milliohm short
Thermal Protection	Derates at 55°C and self protects with recoverable shutdown above 75°C

Environmental, Compliance & Physical

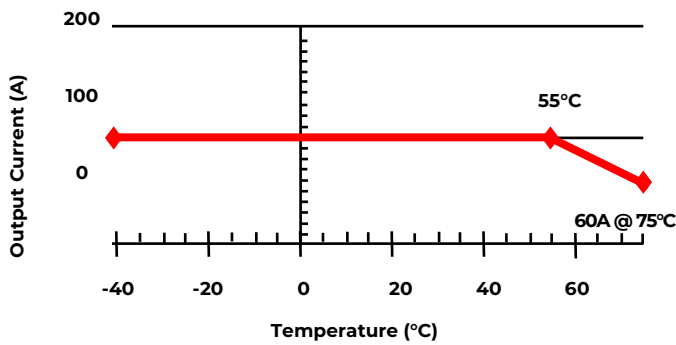|	
Operating Temperature Range (°C)	-40 to +75; (Output derates 2%/°C beginning at 55°C)
Cooling Method	Front to back airflow with onboard temperature controlled fans
Operating Relative Humidity	0 - 95% (non-condensing) for use in a controlled environment
Electromagnetic Compatibility	FCC Part 15; EN 55032 (CISPR32); EN 55035 Level A; GR-1089
Lightning Surge	EN/IEC 61000-4-5 Level 4 (Error free); ANSI C62.41 Category B 100 kHz ring and 1.2/50µs combination waves (6kV damage free)
Agency Certifications	UL1012; EN61204-7; CE; RoHS directive 2015/863
Harmonics	EN61000-3-2
Heat Release	174 Watts or 594 BTU/hr at full load of 2725 Watts, Noise<60 dBA @ 25°C
Mean Time Between Failure (MTBF)	300k Hours @ 25°C per Telcordia SR-332, Method 1, Case 3
Dimensions and Weight (in.) [mm], (lbs) [kg]	1.63 x 5.23 x 13.85 [42 x 133 x 352]; 5.05 [2.2]; packaged 5.95 [2.7]

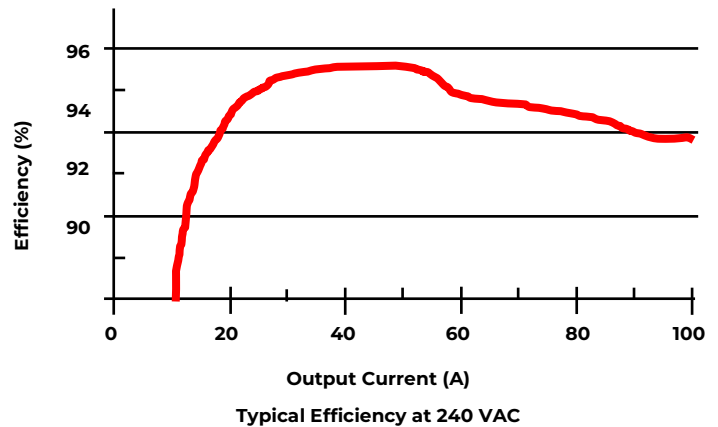IR100ACR024ATEZ_DS   Rev. 1.0

Specifications (Continued)

Output Power vs Input Voltage

(Y-axis: Output Power (Watts); X-axis: Input Voltage (VAC))

94A @ 29V
100A @ 27.25V
103A @ 26.4V   114A @ 24V

Constant Power to 24 Volts

(Y-axis: Output Voltage (V); X-axis: Output Current (A))

55°C
60A @ 75°C

Rated Output Current (V$_{in}$ > 175 VAC)

(Y-axis: Output Current (A); X-axis: Temperature (°C))

Typical Efficiency at 240 VAC

(Y-axis: Efficiency (%); X-axis: Output Current (A))

IR100ACR024ATEZ_DS   Rev. 1.0

Technical Details

Signal Interface

Shown looking into the rear of the power unit
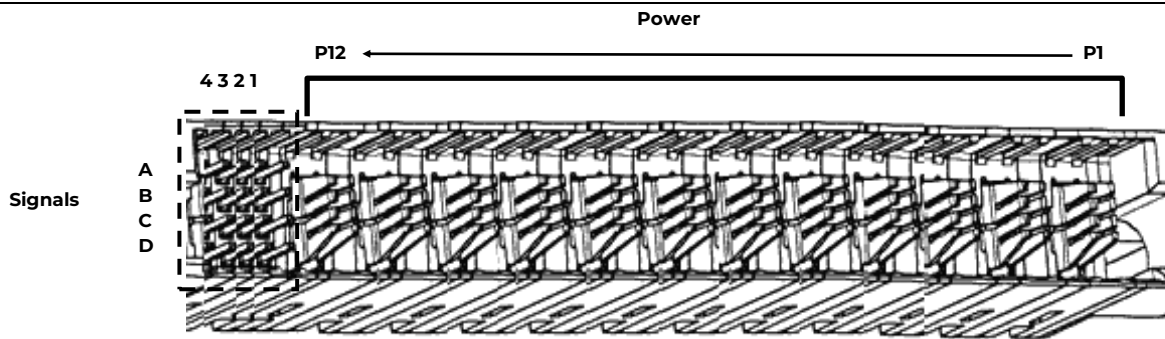
Power Unit Connector - AMP Multi-Beam XL (FCI # 51939-234LF or Tyco # 1900948-1)

Power											
DC									AC		
P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1
-48V	-48V	RTN	RTN	RTN	RTN	+24V	+24V	+24V	PE/GND (ACEG)	L2/N	L1

Signals - Pin Matrix and Functions

	4	3	2	1
A	Interlock	SID4	PSID0	RS-485 (-)
B	Reserved	SID5	PSID1	RS-485 (+)
C	Reserved	SID6	PSID2	Reserved
D	Reserved	SID7	SID3	Return

PIN	LENGTH	DESCRIPTION	
A1	Long	Non-Inverting RS-485 signal line (RS-485 A)	
B1	Long	Inverting RS-485 signal line (RS-485 B)	
C1	Long	Reserved for Factory Programming – Open Circuit in the system shelf	
D1	Long	• Signal Return for PSIDn, SIDn, & Interlock • Power Units Connect Return to NE Common Return internally. • Power Units diode isolate the Return signals from each Power Slot.	
A2	Long	Power Slot Address 0	• Logic 1 = Open Circuit (~3.3V). • Logic 0 = Connection to the Return signal (~0.7V) • Left slot (front view) is Power Slot 1 and has address 000B • Power slot ID signals are connected directly to the Return signal at each Power Slot or left open
B2	Long	Power Slot Address 1	
C2	Long	Power Slot Address 2	
D2	Long	Shelf Address 3	• Logic 1 = Connection to Return signal (~0.7V) • Logic 0 = Open Circuit (~3.3V) • Shelf addresses 1 (00001B) through 31 (11111B) are valid. Shelf address 0 (00000B) is invalid. Address 31 (11111B) disables comm. fail LED • Power Unit Shelf ID signals connect to Shelf Return left open
A3	Long	Shelf Address 4	
B3	Long	Shelf Address 5	
C3	Long	Shelf Address 6	
D3	Long	Shelf Address 7	
A4	Short	Interlock	• Disables power conversion within a Power Unit when not connected to the Return signal • Power Unit Shelves connect Interlock directly to the Return signal at each Power Slot.
B4	Long	Factory Programming	Reserved for Factory Programming – Open Circuit in the system shelf
C4	Long		
D4	Long		

IR100ACR024ATEZ_DS   Rev. 1.0

Technical Details (Continued)

Dimensions

Inch [mm]

5.23 [133]

13.85 [352]

13.33 [339]

LATCH CONTACTOR

TOP VIEW

BOTTOM VIEW

1.63 [41]

FRONT VIEW

0.68 [17]

0.5 [13]

REAR VIEW

IR100ACR024ATEZ_DS

Rev. 1.0
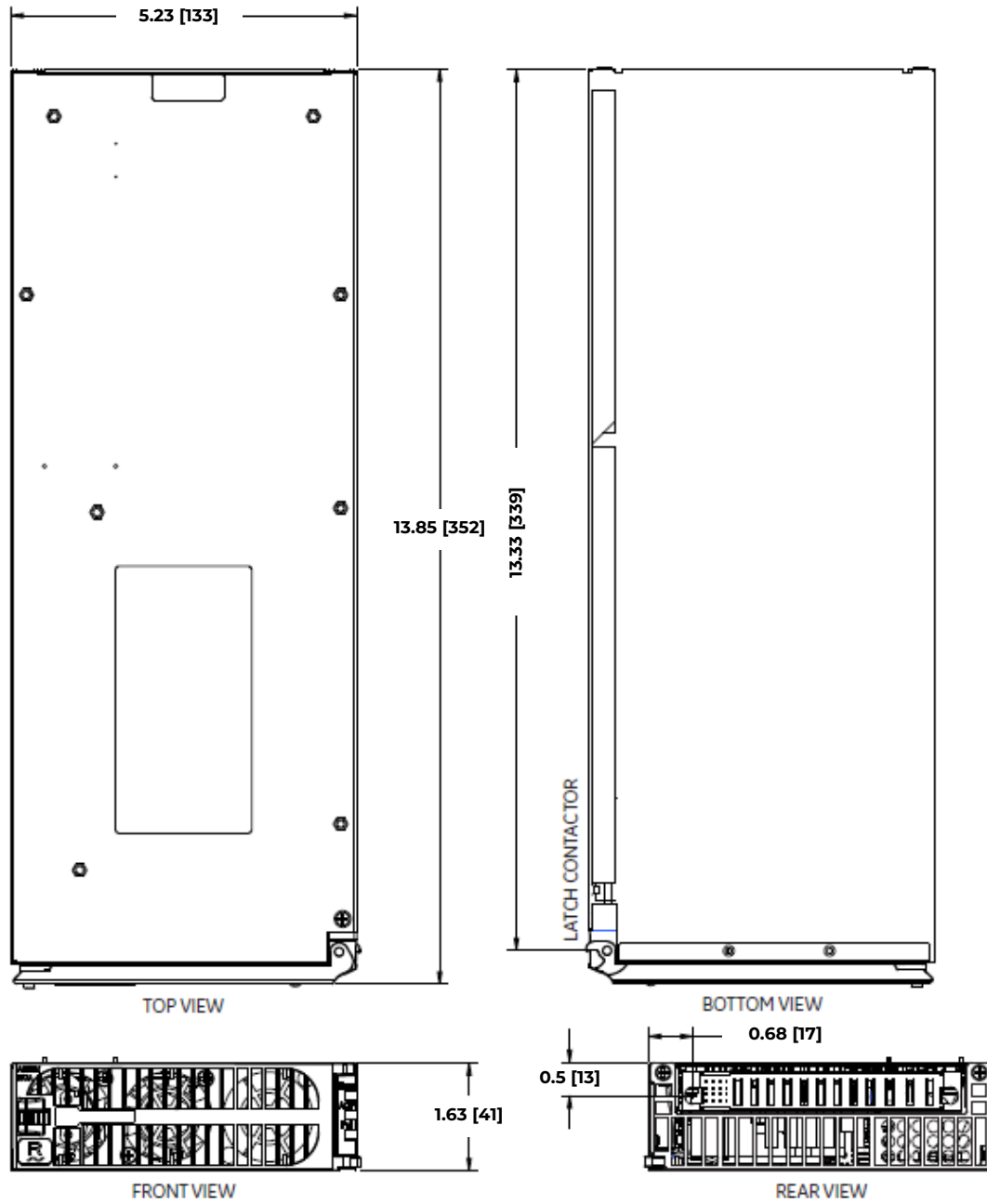
Technical Details (Continued)
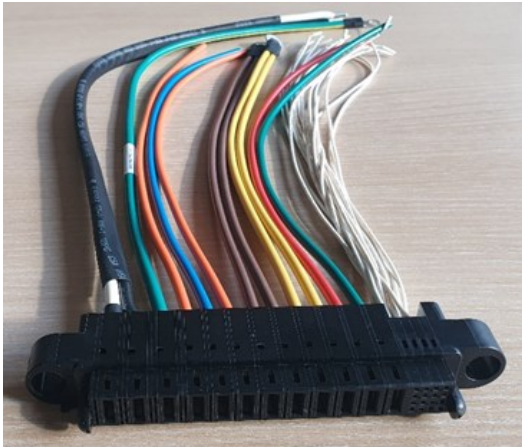
Status LEDs

LED			Condition
Norm ACF Fail	Green ■ □ □	Green Off Off	**Normal operation**: No alarms, inputs and outputs are in the normal range, communicating with the system controller
Norm ACF Fail	□ □ □	Off Off Off	**Unpowered**: No input or output voltage present. 1. Remove and reinsert unit. 2. Check input voltage with voltmeter, if input is present, replace unit. 3. Check output bus voltage with voltmeter, if output bus voltage is present, replace unit.
Norm ACF Fail	■ □ □	Green blink Off Off	**Standby**: The unit is okay, but has been placed in Standby by the controller and is not delivering power. **Note**: if a unit in standby loses communications with the controller it will exit Standby mode and deliver power.
Norm ACF Fail	■ □ □	Amber Off Off/ Red blink	**Output limit**: The unit is okay and delivering maximum output • At max rated output • At configured current limit • At thermal limit If rectifier/converter equipped with optional air filters and reporting thermal limit, check air filters. Clean or replace all filters if necessary.
Norm ACF Fail	□ ■ □	Off Amber Off/ Red blink	**ACF [AC Fail]**: Rectifier input is missing or out of range. • Correct the AC fault
Norm ACF Fail	□ □ ■	Off Off/Amber Red	**Shutdown***: The unit cannot deliver output. • High voltage shutdown • Thermal shutdown • Under voltage protect • Component failure
Norm ACF Fail	□ □ ■	Off Off/Amber Red blink	**Communication Fail**: Blinks to indicate the rectifier is not communicating with a system controller. • Remove and reinsert unit. If fault remains and other units are communicating correctly, replace unit

* When a unit senses an over or under voltage condition it will shutdown, wait 10 seconds, then attempt to restart. If the over or under voltage condition remains it will cycle again. If the rectifier is loaded more than 10%, after 3 restart attempts the unit will lock out, and user intervention is require to restart.

IR100ACR024ATEZ_DS   Rev. 1.0

Ordering Information

Item	Description	Ordering Number
IR100ACR024ATEZ	24 VDC industrial power rectifier	150052771
CONNECTOR	PCB mating connector for IR or NE rectifiers (multi-beam XL)	1888132-1
RECEPTACLE CABLE ASSY_NE SERIES	Single unit cable assembly for IR or NE rectifiers with AC inputs and 24, 48, or 125 VDC output (multi-beam XLE)	8600256037P

IR100ACR024ATEZ_DS   Rev. 1.0

OmniOn Power Inc.

601 Shiloh Rd.
Plano, TX USA

omnionpower.com

We reserve the right to make technical changes or modify the contents of this document without prior notice. OmniOn Power does not accept any responsibility for errors or lack of information in this document and makes no warranty with respect to and assumes no liability as a result of any use of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of OmniOn Power. This document does not convey license to any patent or any intellectual property right. Copyright© 2023 OmniOn Power Inc. All rights reserved.

IR100ACR024ATEZ_DS
Rev. 1.0