

Integritas™ IR100ACR024ATEZ Rectifier



Uncompromised advanced power

The ABB 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.

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 |

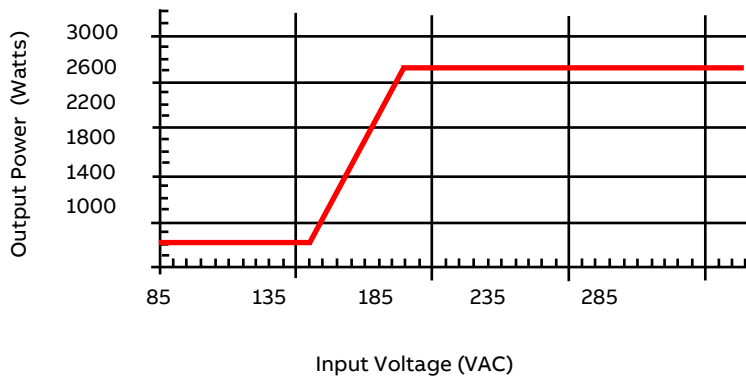
Outputs

| | |
|-----------------------------|--|
| 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 |

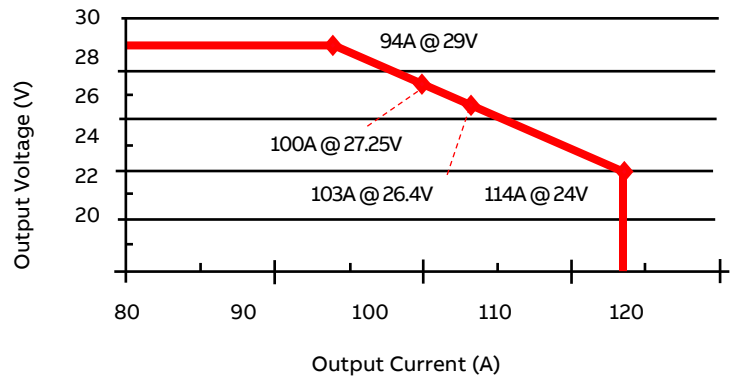
Environmental, Compliance & Physical

| | |
|--|---|
| 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] |

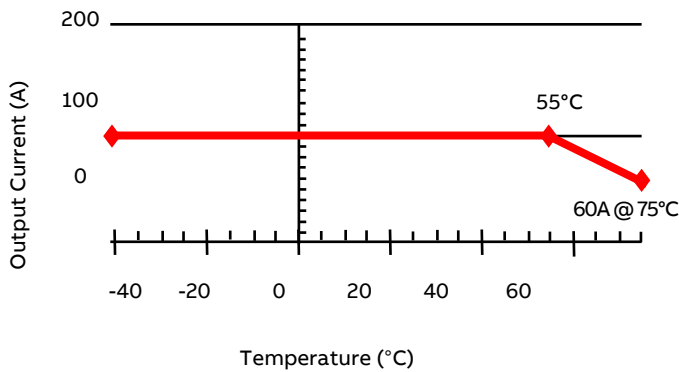
Specifications (Continued)



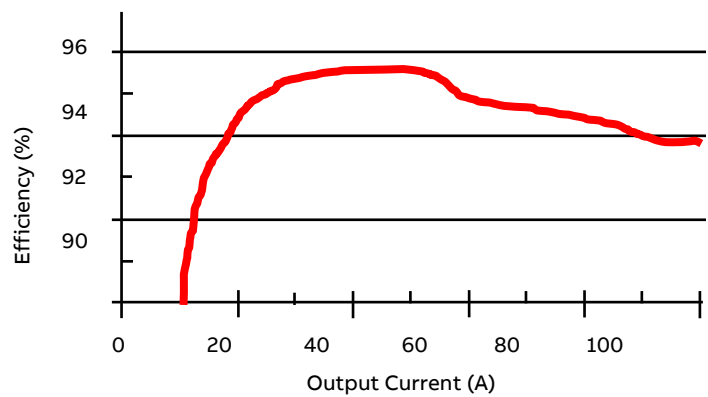
Output Power vs Input Voltage



Constant Power to 24 Volts



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

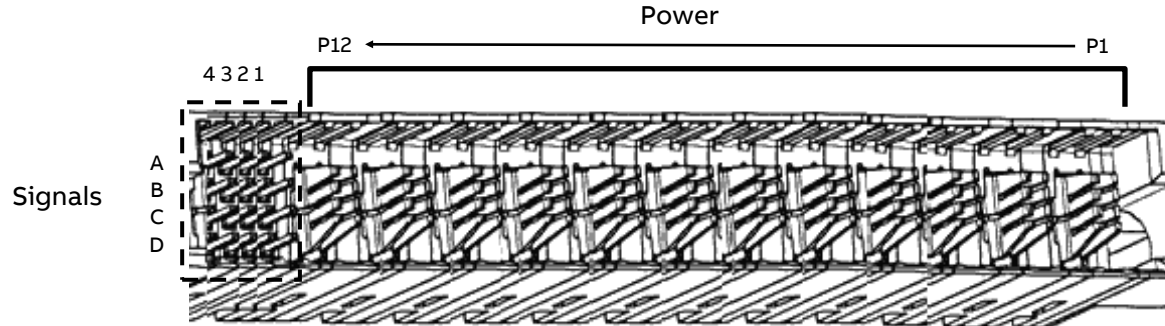


Typical Efficiency at 240 VAC

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 |

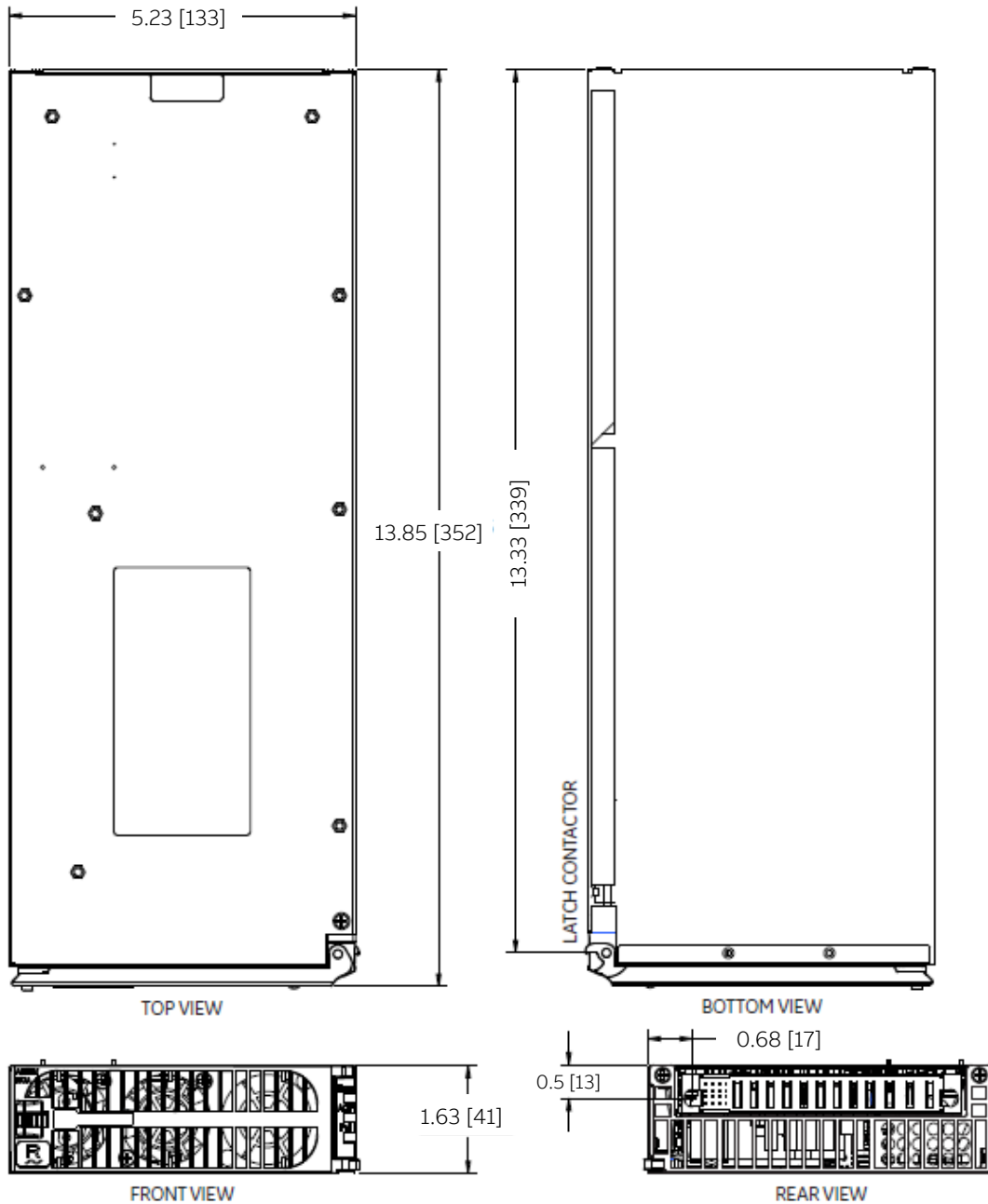
PIN LENGTH DESCRIPTION

| 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 | <ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> Logic 1 = Open Circuit (~3.3V). Logic 0 = Connection to the Return signal (~0.7V) |
| B2 | Long | Power Slot Address 1 <ul style="list-style-type: none"> Left slot (front view) is Power Slot 1 and has address 000B |
| C2 | Long | Power Slot Address 2 <ul style="list-style-type: none"> Power slot ID signals are connected directly to the Return signal at each Power Slot or left open |
| D2 | Long | Shelf Address 3 <ul style="list-style-type: none"> Logic 1 = Connection to Return signal (~0.7V) |
| A3 | Long | Shelf Address 4 <ul style="list-style-type: none"> Logic 0 = Open Circuit (~3.3V) |
| B3 | Long | Shelf Address 5 <ul style="list-style-type: none"> Shelf addresses 1 (00001B) through 31 (11111B) are valid. Shelf address 0 (00000B) is invalid. Address 31 (11111B) disables comm. fail LED |
| C3 | Long | Shelf Address 6 <ul style="list-style-type: none"> Power Unit Shelf ID signals connect to Shelf Return left open |
| D3 | Long | Shelf Address 7 <ul style="list-style-type: none"> 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. |
| A4 | Short | Interlock <ul style="list-style-type: none"> 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 | |
| C4 | Long | Factory Programming <ul style="list-style-type: none"> Reserved for Factory Programming – Open Circuit in the system shelf |
| D4 | Long | |






















Technical Details (Continued)

Dimensions

Inch [mm]



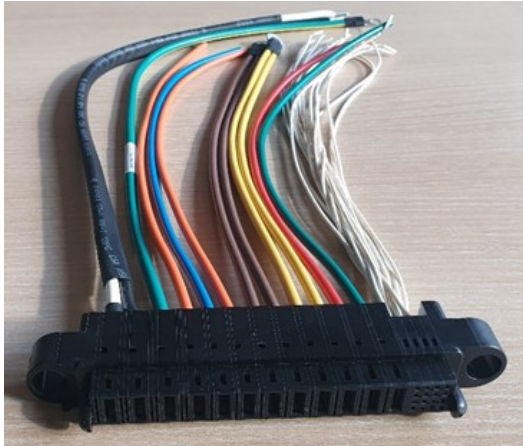
Technical Details (Continued)

| Status LEDs | | | Condition |
|-------------|---|----------------|---|
| LED | | | |
| Norm |  | Green | Normal operation: No alarms, inputs and outputs are in the normal range, communicating with the system controller |
| ACF |  | Off | |
| Fail |  | Off | |
| Norm |  | 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. |
| ACF |  | Off | |
| Fail |  | Off | |
| Norm |  | Green blink | 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. |
| ACF |  | Off | |
| Fail |  | Off | |
| Norm |  | Amber | 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. |
| ACF |  | Off | |
| Fail |  | Off/ Red blink | |
| Norm |  | Off | ACF [AC Fail]: Rectifier input is missing or out of range. • Correct the AC fault |
| ACF |  | Amber | |
| Fail |  | Off/ Red blink | |
| Norm |  | Off | Shutdown*: The unit cannot deliver output. • High voltage shutdown • Thermal shutdown • Under voltage protect • Component failure |
| ACF |  | Off/Amber | |
| Fail |  | Red | |
| Norm |  | Off | 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 |
| ACF |  | Off/Amber | |
| Fail |  | Red blink | |

* 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.

Technical Details (Continued)

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 | <p>Single unit cable assembly for IR or NE rectifiers with AC inputs and 24, 48, or 125 VDC output (multi-beam XLE)</p>  | 8600256037P |



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