GE Critical Power

EP1000UTEZ Single Phase Rectifier

fact sheet

Applications

- Telecommunications networks
- Digital subscriber line (DSL)
- Indoor/outdoor wireless
- Routers/ VoIP/Soft and other Telecom Switches
- Fiber in the loop
- Transmission
- Data networks
- Remote Radio Heads
- Small Cell Sites

Use Scenarios

The SPS TE rectifiers are single phase, hot-pluggable, fan cooled rectifiers that provide highly reliable DC power. As cost-effective rectifiers that occupy just 1RU, its shallow depth is an ideal power solution for space critical applications. The constant output power characteristics as well as the extended temperature range, universal AC input voltage range and compact size are key attributes that make this rectifier the right choice for your power needs.

These rectifiers are applicable for indoor and outdoor environments especially where equipment depth and height are restricted. The SPS TE rectifiers communicate digitally to the Pulsar Edge controller family over a RS485 bus to add extensive monitoring and alarm management facilities. Its flexible and sophisticated feature set makes this front-end supply an excellent choice for power in a variety of application spaces.

Should there be a rectifier fault, up to 12 units can be placed in parallel. In addition to applications without batteries on the output, the EP1000 is suitable for use in traditional centralized battery applications, or in distributed systems with traditional or advanced battery technology. Isolated serial communications and extensive testing allow the EP1000 to work in either n+1 or N+N configurations.

A full featured, N+N redundant, 100-277 V_{ac} to 48 V_{dc} battery reserve system can be provided in 1 Rack Unit (1.75 inches) of 19 inch rack space. Three EP1000s and a GE Critical Power Edge controller enable AC feed to cabinet distributed battery systems.

This 100-277 V_{ac} standard product is designed to be deployed internationally. This rectifier an excellent choice for 48V system loads from 500 to 3000 W.

EP1000UTEZ Rectifier

Key Features

- Small size: 42mm (1.64 in. or 1U) tall x 127mm (5in.) x 438 mm (17.25 in.) deep
- Extended temperature range: -40 to +75 °C
- Efficient with 94 % typical efficiency from 50 to 100% load
- Universal AC input: 1000 Watts at 48 Vdc from 90 to 305 VAC
- Constant power for output voltages from 49 to 58 Vdc (Output voltage programmable: Off, and from 42 to 58 Vdc)
- Parallel up to 12 rectifiers with analog load sharing
- RS485 interface to any GE Critical Power battery plant controller for use with almost any battery technology.
- Fail safe performance – Internal faults isolated from output bus; hot insertion capabilities allow for rectifier replacement without system shutdown; soft start and inrush current protection prevent nuisance tripping of upstream breakers.
- Simple Human Factors – 3 front panel LEDs indicate Output good (Green), Alarm (Yellow) or Fault (Red)
- Agency Compliant - CE mark to Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/E, UL 60950-1, Recognized, CSA C22.2 No. 60950-1-03 Certified VDE0805:2001 12 (EN 609501) Licensed, NEBS GR-1089, GR-63-CORE, RoHS6/6.

Electrical Specifications

INPUT

Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage Range	V_{IN}	90	100/120 208/240	305	V_{ac}
Voltage Swell (no damage)	V_{IN}			320	V_{ac}
Frequency	F_{IN}	45	50/60	65	Hz
Operating Current	I_{IN}		12.5-9.3A @ 90-120V_{ac} 5.1A @ 230V_{ac}		A_{ac}
Inrush Transient (25°C, excluding X-Capacitor charging)	I_{IN}		25		A_{PK}
Leakage Current (per Ø, 530V_{ac}, 60Hz)	I_{IN}			3.5	mA
Power Factor (50 – 100% load)	PF		~1.0		
Efficiency (@ 25°C from 50 to 100% load)	η		94@230 V_{ac}		%
Holdup time (output allowed to decay down to 40V_{dc})	T	10			ms

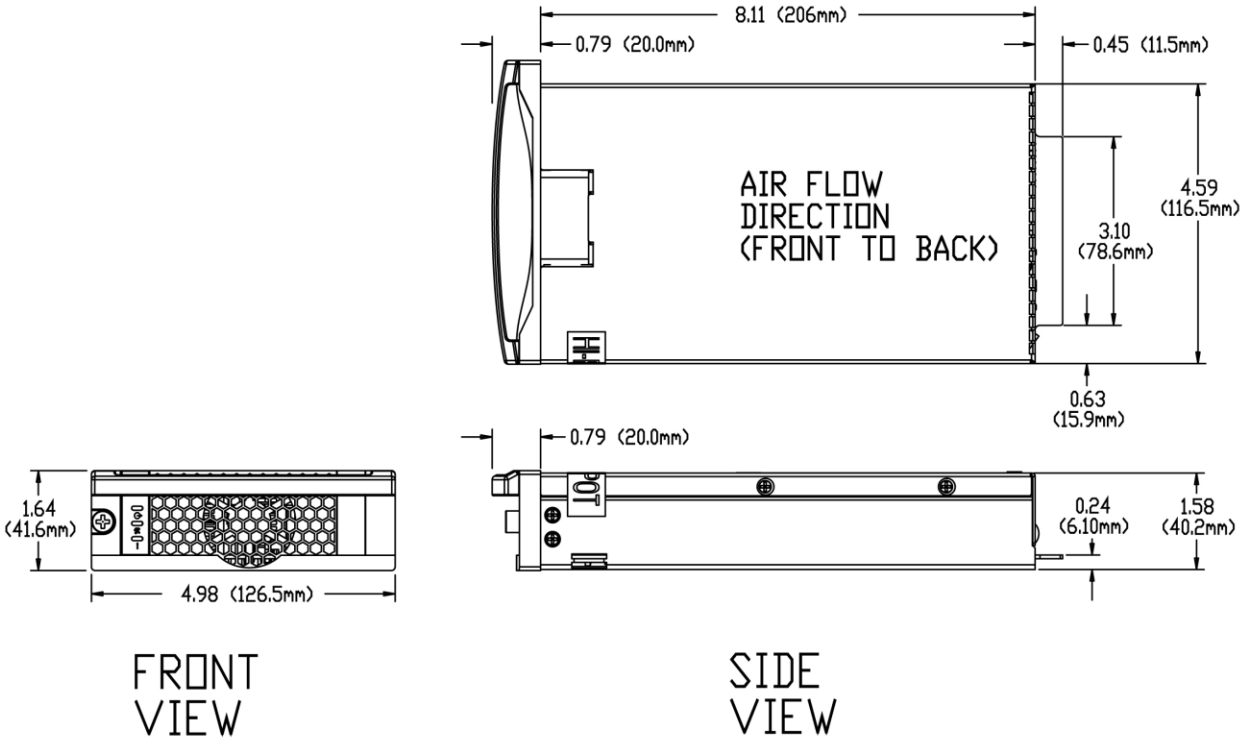
OUTPUT -54V_{DC} MAIN

Parameter	Symbol	Min	Typ	Max	Unit
Output Power	W	1000			W_{dc}
Voltage Adjust Range	V_{OUT}		52		V_{dc}
Overall regulation (load, temperature, aging)		-2		+2	%
Output Voltage Set Range - Set by firmware		42		58	V_{dc}
Output Current (54 / 52V_{dc}, T_{amb} = 45°C)	I_{Out}	1	20		A_{dc}
Output Ripple Peak-to-Peak (5Hz to 20MHz)	V_{OUT}		<200	250	mV_{p-p}
Psophometric Noise				5	mV
Overvoltage Protection	V_{ovp}		59.5		V_{dc}
Turn on time				5	s

Environmental, Compliance & Physical

Operating Ambient Temperature, Storage Temperature	-40°C to +75°C, -40°C to +85°C
Operating Relative Humidity	0 - 95% (non-condensing) for use in a controlled environment
Cooling Method, Altitude, Audible Noise	Front to back airflow with onboard fan, 4000M max, <55 dBA
Electromagnetic Compatibility, ESD	CISPR22 (EN55022) Class B and FCC-CFR, Part 15, sub-part B Class B with shelf; GR1089 Class A, EN61000-4-2, Level 4
Agency Certifications	*CE mark to Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/E; UL 60950-1, Recognized; CSA C22.2 No. 60950-1-03 Certified; VDE0805:2001 12 (EN 609501) Licensed*
Heat Release	64 Watts, or 218 BTU/hr at full load of 1000 Watts
Mean Time Between Failure (MTBF)	250k Hours @ 25°C per Telcordia SR-332, Method 1
Height x Width x Depth, Weight	42mm (1.64in.) x127mm (5in.) x 438 mm (17.25 in.) deep, 1.64 kg (3.6 lbs)

Outline Drawing

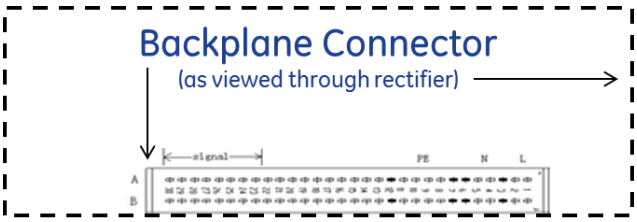


Front Panel LEDs

Three front panel LEDs communicate as indicated here:

Rectifier State	LED		
	Output Good	Alarm	Fault
On and producing power	On	Off	Off
No AC	Off	Off	Off
Stand by GP	Blink	Off	Off
Stand by PS-OFF	Blink	Off	Off
Over current / constant power	On	On	Off
Over temperature warning	On	On	Off
Over temperature shutdown	Off	Off	On
AC failure	Off	Off	On
Output short circuit	Off	Off	On
Output under voltage	Off	Off	On
Output over voltage	Off	Off	On
Communications loss	On	Off	Blink

Connector Pin Description



Pin Assignments

Pin Number	Function	Description
Power Pins		
A1, A2, B1, B2	L	Line
A4, A5, B4, B5	N	Neutral
A8 to A11 B8 to B11	PE	Protective Earth for the rectifier (*Long pin)*
A13 to A22	48V+	Positive output
B13 to B22	48V-	Negative output (*Long pin)*
Signal Pins		
A23	FAULT＋	Isolated open collector output with internal 100 ohms series resistor. Closed to ALARM-GND in normal non-FAULT condition. Opens (high resistance) with respect to ALARM-GND during a FAULT condition. Maximum sink current 3mA.
A24	ALARM＋	Isolated open collector output with internal 100 ohms series resistor. Closed to ALARM-GND in normal non-ALARM condition. Opens (high resistance) with respect to ALARM-GND during an ALARM condition. Maximum sink current 3mA.
B23	ALARM-GND	Isolated ground for FAULT, ALARM and PS-OFF signals.
B24	PS-off	Rectifier disable signal. Input to the opto-isolator diode with 1000 ohms in series, requires 3mA (min) to 6mA (max) to turn the rectifier off.
B25	SHARE+	Current sharing bus (*Short pins)*
A25	SHARE-	
A26	PS-enable	Enable signal, connect to GND to enable the rectifier *(Short pin); This pin shall also be used for rectifier "Power Keying". Appendix 2*
B26	PS-present	Module present signal connected to ALARM-GND inside the rectifier (*Short pin)*
A27	GND	Signal GND
B27	ADDR0	Address signals. Address 111 allows standalone operation by disabling the blinking communication fail LED.
A28	ADDR1	
B28	ADDR2	
A29	8V_INT	8 V DC internal back-bias (~150mA)
A30	ComGND	RS485 circuit reference ground, connected to GND via a low value resistor inside the rectifier.
B29	RS485_A	RS485 communication signals; RS485_A is the Signal + or non-inverting (+) pin aka '+' aka TxD+/RxD+. RS485_B is the Signal- or inverting (-) pin aka TxD-/RxD. (Short pins)
B30	RS485_B	