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GP100 6 kW True Three Phase Rectifier



Applications

- Cloud Data Centers that want phase balanced IT loads
- Super Computers
- 380/480 V_{ac} Three Wire 3Ø directly to data cabinets
- Routers/VoIP/Soft and other Telecom Switches
- 48 V_{dc} distributed power architectures
- Industrial Applications

Advanced Features

- Remote Upgrade from RS485 (or I²C)
- Improved Power Metering Accuracy
- Preemptive Analytics

Use Scenarios

The GP100 Rectifier provides a high efficiency, intrinsically phase balanced way to power data center cabinets directly from 3 wire 3Ø 480Vac (or 380 Vac). The AC can be supplied by a UPS, Generator, or line transformer with any accepted winding or grounding configuration. The neutral wire is not connected to the GP100, so there is zero risk of neutral currents in any normal or fault scenario.

Should there be a line fault, the GP100 is compatible with GE TLE UPSs in Ring Bus or traditional configurations, as well as other UPSs with a transfer time of less than 8 ms. Should there be a rectifier fault, the GP100 is parallelable up to 100 units. In addition to applications without batteries on the output, the GP100 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 GP100 to work in either n+1 or N+N configurations.

The GP100 System provides a full featured, N+N redundant 480Vac to 48Vdc battery reserve system in one 19" rack unit. Two GP100s and a GE Critical Power Edge controller in each cabinet allow 480Vac to be the only building level distribution voltage. Application tailored energy storage batteries can be deployed in data cabinets as needed. The standard GP100 is designed for international deployment, accepting 3 phase power from 380V (Global) or 480V (North American) sources. This system is an excellent choice for facility scale data applications requiring modular, very high efficiency AC to 48Vdc intermediate voltage conversion, such as in cloud data centers.

Features

- Compact 1RU form factor provides high power density of 27 Watts/Cubic inch
- Efficient with 96.5% efficiency from 50 to 100% load
- Balanced draw from each of the three AC input phases
- 6000 Watts at 48 Vdc from three wire 3Ø 380 or 480 Vac (no neutral is needed)
- Constant power for output voltages from 48 to 58 Vdc (Output voltage programmable: Off, and from 42 to 58 Vdc)
- Communications choices: RS485 or PMBus compliant Dual redundant I2C serial bus with +5V aux @ 2A
- Operates over a broad temperature range: -40°C through +75°C (Output derates at 2% per °C beginning at +55 °C)
- 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.
- Extended service life – parallel operation with automatic load sharing ensures that units are not unduly stressed
- Simple Human Factors – 3 front panel LEDs indicate AC good (Green), DC good (Green) or Fault (Red)
- Agency Compliant – EN/IEC/UL/CSA C22.2 60950-1 2nd edition +A1, CE mark, FCC part 15, EN55022 Class A, EN61000 immunity and transient, EN/IEC 61000-3-2 and EN 60555-2 Power factor correction, IPC 9592 Class II Shock & Vibration, NEBS GR-1089, GR-63-CORE, RoHS6/6.

Electrical Specifications

Input

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Startup Input Voltage	V _{IN}	300		320	V _{ac}
Operating Voltage Range (3Ø with safety frame ground)	V _{IN}	320	380/480	530	V _{ac}
Voltage Swell (no damage)	V _{IN}			600	V _{ac}
Frequency	F _{IN}	47	50/60	66	Hz
Operating Current (3Ø - all phases operational)	I _{IN}		10-8		A _{dc}
Inrush Transient (per Ø at 480V _{ac} , 25°C, excluding X-Capacitor charging)	I _{IN}		25	30	A _{pk}
Leakage Current (per Ø, 530V _{ac} , 60Hz)	I _{IN}		5		%
Power Factor (50 - 100% load)	PF	0.96	0.995		
Efficiency (480V _{ac} @ 25°C from 50 to 100% load)	η		96.5		%
Holdup Time (output allowed to decay down to 40V _{dc})	T		12		ms
Ride Through (at 480V _{ac} , 25°C)	T		1/2		cycle

Output -52VDC Main

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Output Power (430 - 530V _{ac} - 3Ø, T _{amb} = 45°C V _{out} > 48V _{dc})	W	6000			W _{dc}
Default Set Point	V _{OUT}		52		V _{dc}
Overall Regulation (load, temperature, aging) 0 - 45°C, LOAD > 2.5A > 45°C Regulation with Controller		-2		+2	%
		-0.05		+0.05	%
Output Voltage Set Range - Set by firmware		42		58	V _{dc}
Output Current (54 / 52V _{dc} , T _{amb} = 45°C)	I _{OUT}	1		111 / 115	A _{dc}
Output Ripple Peak-to-Peak (5Hz to 20MHz)	V _{OUT}			250	mV _{p-p}
External Bulk Load Capacitance	C _{OUT}	0		1700	μF/A

Environmental, Compliance & Physical

Operating Ambient Temperature Range	-40°C to +75°C (Output derates at 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 55022 (CISPR22), EN 55024, Level A, GR-1089
Agency Certifications* Planned	UL1950, EN60950, CSA 234/950, NEBS GR-1089, GR-63-CORE, CE Mark, RoHS 6/6
Heat Release	217 Watts, or 740 BTU/hr at full load of 6000 Watts
Acoustic Noise	<58dBA @ 25°C
Mean Time Between Failure (MTBF)	300k Hours @ 25°C per Telcordia SR-332, Method 1, Case 3
Height x Width x Depth, Weight, Packaged Weight	1.61x7.97x17.36in (41x202x441mm), 8.95 lbs (4.1 kg), 9.85 lbs (4.5 kg)

Ordering Options

PRODUCT CODE	DESCRIPTION	OUTPUT VOLTAGE	COMCODE
GP100H3R48TEZ	110A rectifier with isolated RS485 communications	52V	150034309
GP100H3R48TEZ-IN	110A rectifier with isolated RS485 communications	48V	150045497
GP100H3M54TEZ	110A rectifier with isolated dual I ² C communications	54V	150039274

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