GP100H3R48TEZ Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} Input; Default Output: 525Vdc@ 6000W – GP interface

RoHS Compliant

Applications

- 48V_{DC} distributed power architectures
- Routers/ VoIP/Soft and other Telecom Switches
- LAN/WAN/MAN applications
- File servers, Enterprise Networks, Indoor wireless
- SAN/NAS/iSCSI applications

Features

- Efficiency 96.5% typical, exceeds 80plus Titanium levels
- Compact 1RU form factor with 30 W/in^3 density
- Constant power from 48 – 58V_{DC}
- 6000W from nominal 3Φ-380/480V_{AC}
- Isolated RS485 based serial bus
- Power factor correction (meets EN/IEC 61000-3-2 and EN 60555-2 requirements)
- Output overvoltage and overload protection
- AC Input overvoltage and undervoltage protection
- Over-temperature warning and protection
- Redundant, parallel operation with active load sharing
- Internally controlled Variable-speed fan
- Hot insertion/removal (hot plug)
- Three front panel LED indicators
- EN/IEC/UL/CSA C22.2 60950-1 2nd edition +A1
- CE mark§
- Meets FCC part 15, EN55022 Class A standards
- Meets EN61000 immunity and transient standards
- Shock & vibration: Meets IPC 9592 Class II standards

Description

The GP100H3R48TE series of rectifiers provide significant efficiency improvements in the Global Platform of Power supplies. High-density front-to-back airflow is designed for minimal space utilization and is highly expandable for future growth. The 3Φ - 380/480Vrms input product is designed to be deployed internationally. It is configured with an isolated RS485 compliant communications bus that allows it to be used in a broad range of applications. Feature set flexibility makes these rectifiers an excellent choice for applications requiring modular, very-high-efficiency AC to - 52V_{DC} intermediate voltages, such as in distributed power.

* *UL* is a registered trademark of Underwriters Laboratories, Inc.
† *CSA* is a registered trademark of Canadian Standards Association.
§ This product is intended for integration into end-user equipment. All *CE* marking procedures of end-user equipment should be followed. (The CE mark is placed on selected products.)
** *ISO* is a registered trademark of the International Organization of Standards

imagination at work

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

Parameter	Symbol	Min	Max	Unit
Input Voltage: Continuous	V_{IN}	0	600	V_{AC}
Operating Ambient Temperature[1]	T_A	-10	75	°C
Storage Temperature	T_{stg}	-40	85	°C
I/O Isolation voltage to Frame (100% factory Hi-Pot tested)			2087	V_{AC}

Electrical Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, Vo=52V_{DC}, resistive load, and temperature conditions. To meet measurement accuracy a warm up time of 1hr may be required.

INPUT

Parameter	Symbol	Min	Typ	Max	Unit
Operating Voltage Range (3Φ delta with safety frame ground)	V_{IN}	320	380/480	530	V_{AC}
Low voltage Turn-OFF	V_{IN}	(300)		320	
Turn-ON		(315)		330	
Hysteresis		5			
High voltage Turn-OFF	V_{IN}	530		(550)	
Turn-ON		520		(540)	
Hysteresis		5			
Input voltage phase unbalance	V_{IN}	-15		10	%
Frequency	F_{IN}	47		63	Hz
Operating Current (3Φ - all phases operational)	I_{IN}			15	A_{AC}
Input current phase unbalance [load > 50% of FL]				1	%
Inrush Transient (per Φ at 480V_{RMS}, 25°C, excluding X-Capacitor charging)	I_{IN}		25	30	A_{PK}
Source Impedance (NEC allows 2.5% of source voltage drop inside a building)		0.20	0.25		Ω
Idle Power (at 480V_{AC}, 25°C) Main output OFF	P_{IN}		15		W
Main output ON @ Io=0			25		
Leakage Current (per Φ, 530V_{AC}, 60Hz)	I_{IN}		2.5	3.5	mA
Power Factor (50 – 100% load)	PF	0.96	0.995		
Efficiency (380/480V_{AC} @ 25°C) 10% load	η		91		%
20% load			94		
50% load			96.5		
100% load			96		
Holdup time (V_{in} = 320V_{rms}, V_{out} ≥ 42V_{DC}, constant power load)	T	10	12		ms
Ride through (at 480V_{AC}, 25°C, constant power load)	T	1/2	1		cycle
Isolation (per EN60950) Input – Output	V	3000			V_{AC}
Input-Chassis/Signals		2000			V_{AC}

[1] See the derating guidelines under the Environmental Specifications section

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

Electrical Specifications (continued)

52V_{DC} MAIN OUTPUT

Parameter	Symbol	Min	Typ	Max	Unit
Output Power (320 – 530V_{AC} – 3Φ, T_{AMB}= 0 – 45°C)	W	6000			W_{DC}
GP100H3R48TEZ Factory set default set point V_{IN} = 480V, I = 10% FL, 25°C Nominal set point (droop regulation; max-no load, min-full load)	V_{OUT}	 -50	52	 450	 V_{DC} mV_{DC}
GP100H3R48TEZ-IN Factory set default set point V_{IN} = 480V, I = 10% FL, 25°C Nominal set point (droop regulation; max-no load, min-full load)	V_{OUT}	 -50	48	 450	 V_{DC} mV_{DC}
Overall regulation (load, temperature, aging) 0 – 45°C LOAD > 2.5A T_{AMB} > 45°C	V_{OUT}	-0.5 -2		+0.5 +2	% %
Output Current (T_{AMB} = 45°C) V_{OUT} = 52V_{DC} V_{OUT} = 48V_{DC}	I_{Out}	1 1		115 125	A_{DC}
Current Share (> 50% FL) remotely controlled I_{SHARE} is employed Max units parallelable remotely controlled		-2		2 100	%FL units
Output Ripple RMS (5Hz to 20MHz) (20MHz bandwidth, load > 10%FL) Peak-to-Peak (5Hz to 20MHz) Load < 10%FL	V_{OUT}			100 250 400	mV_{rms} mV_{p-p} mV_{p-p}
Voice Band Output Noise — With 880Ahr battery in system	V_{OUT}			45	dBrnC
Voice Band Output Noise — Without battery	V_{OUT}			55	dBrnC
Voice Band Output Noise — Psophometric Noise	V_{OUT}			2[2]	mV_{rms}
External Bulk Load Capacitance	C_{OUT}	0		1,700	µF/A
Turn-On (**monotonic turn-ON** from 30 – 100% of Vnom, above -5°C[3]) Delay	T		5		s
Rise Time – RS-485 mode 55A (50% load)	T	2.5			s
83A (75% load)	T	5			s
100A (90% load)	T	8			s
Output Overshoot	V_{OUT}			2	%
Load Step Response ΔI [V_{IN} = 380/480V_{AC}, 25°C, load step 20% ↔ 80%, di/dt = 1A/µs] ΔV, (380/480 V_{AC}, 25°C) Settling Time to normal regulation	 I_{OUT} V_{OUT} T	 -5		 60 5 2	 %FL % ms
Overload[4] - Power limit when V_{OUT} ≥ 48V_{DC} recoverable current limit when 40V_{DC} < V_{OUT} < 48V_{DC} Output shutdown (one retry after a 2 – 10 second delay)	P_{OUT} I_{OUT} V_{OUT}	6050 110		 120 36	W_{DC} %FL V_{DC}
Short circuit protection	No damage				
System power up	Upon startup, delay overload shutdown for 20 seconds to allow the insertion and startup of multiple modules within a system.				
Overvoltage — 200ms delayed shutdown (default)	V_{OUT}	59	59.5	60	V_{DC}
Overvoltage — Immediate shutdown	V_{OUT}	> 65			V_{DC}
Overvoltage — Programmable range	V_{OUT}	44		59.5	V_{DC}
Overvoltage — Latched shutdown	If 3 restart attempted within a 30 sec window unit latches OFF				
Overvoltage — Restart delay		3.5	4	5	sec
Over-temperature warning (prior to commencement of shutdown) Shutdown (below the max device rating being protected) Restart attempt Hysteresis (below shutdown level)	T		5 20 10		°C
Isolation Output-Chassis	V	500			V_{DC}
Restart/Reset conditions	Loss of input > 100ms or Output OFF followed by ON command				

[2] Complies with ANSI TI.523-2001 section 4.9.2 emissions max limit of 20mV flat unweighted wideband noise limits

[3] Below -5°C, the rise time is approximately 5 minutes to protect the bulk capacitors.

[4] Overload retries must incorporate normal soft-start turn-ON.

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

General Specifications

Parameter	Min	Typ	Max	Units	Notes
Calculated Reliability		560,000 190,000		Hours	Full load, 25°C ; Full load, 55°C ; - MTBF per Telecordia SR232 Reliability protection for electronic equipment, issue 3, method I, case III,
Service Life		10		Years	80% load, 35°C ambient, excluding fans
Unpacked Weight		4.3/9.5		kg/lb	
Packed Weight		4.9/10.8		kg/lb	
Heat Dissipation	200 Watts or 682 BTUs @ 80% load, 250 Watts or 853 BTUs @ 100% load				

Signal Specifications

Unless otherwise indicated, specifications apply over all operating input voltage, resistive load, and temperature conditions. Signals are referenced to Logic_GND unless noted otherwise. See the Signal Definitions table for additional information.

Parameter	Symbol	Min	Typ	Max	Unit
Interlock [Connected externally, referenced to Vout (-)] Normal operation	V	0		3.3	V_{DC}
Interlock2 [Connected externally to Logic_GND] Normal operation	V	—		0.4	V_{DC}
Module Present [Internally shorted to Logic_GND] Normal operation	V	—		0.4	V_{DC}
8V_INT (no components should be connected to this pin) Interconnected between power supplies to back-bias the internal secondary processor					

Digital Interface Specifications

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
RS485 Isolation from the main output					60	V_{DC}
Standard measurement parameters	Update frequency Report delay after 25% step Report delay to accuracy				1 2 10	Hz sec sec
I_{OUT} measurement range		I_{MR}	0		130	A_{DC}
I_{OUT} measurement accuracy 25°C	> 25A < 25A	$I_{OUT(ACC)}$	-1 2.5		+1 2.5	% of FL A_{DC}
V_{OUT} measurement range		$V_{OUT(rMR)}$	0		70	V_{DC}
V_{OUT} measurement accuracy[5]		$V_{OUT(ACC)}$	-1		+1	%
P_{OUT} measurement range		$P_{OUT(rMR)}$	0		6100	W_{DC}
P_{OUT} measurement accuracy	30°C -5°C – 55°C	$P_{OUT(ACC)}$	-30 TBD		30 TBD	W_{DC}
Temp measurement range		$Temp_{(rMG)}$	0		150	°C
Temp measurement accuracy[6]		$Temp_{(ACC)}$	-5		+5	%
V_{IN} measurement range, each phase		$V_{IN(rMG)}$	0		600	V_{AC}
V_{IN} measurement accuracy		$V_{IN(ACC)}$	-1.5		+1.5	%
I_{IN} measurement range, each phase		$I_{IN(MR)}$	0		20	A_{DC}
I_{IN} measurement accuracy		$I_{IN(ACC)}$	-0.5		0.5	% of FL
P_{IN} measurement range, computed 3Φ result		$P_{in(rng)}$	0		6750	W_{in}
P_{IN} measurement accuracy	> 500W 100 – 500W < 100W	$P_{in(acc)}$	-1.5 2.5 30		+1.5 2.5 30	% % W

[5] Above 2.5A of load current

[6] Temperature accuracy reduces non-linearly with decreasing temperature

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

Environmental Specifications

Parameter		Min	Typ	Max	Units	Notes
Ambient Temperature		-5[7]		55	°C	Air inlet from sea level to 5,000 feet.
Storage Temperature		-40		85	°C	
Operating Altitude				1524/5000	m / ft	
Non-operating Altitude				8200/30k	m / ft	
Power Derating with Temperature				2.0	%/°C	55°C to 75°C[8]
Power Derating with Altitude				2.0	°C/305 m °C/1000 ft	Above 1524/5000 m/ft; 3962/13000 m/ft max
Humidity	Operating Storage	5 5		95 95	% %	Relative humidity, non-condensing
Shock and Vibration	Operational	Meets IPC 9592 Class II, Section 5 and GR-63_CORE requirements				
	Packaged	0.02 0.01 0.005			g^2/Hz	ModifiedlASTM-D-4728-91 8-hour duration on each axis
Acoustic Noise			55	58	dBA	
Earthquake Rating		4			Zone	Meet GR-63_CORE requirements
Insulation Resistance						

EMC [Surges and sags applied one Φ at a time and all 3Φ's simultaneously; phase angles 0, 90, 270°

Parameter	Function	Standard	Level	Criteria	Test
AC input	Conducted emissions	EN55022, FCC part 15 EN61000-3-2 Telcordia GR1089-CORE	A – 6dB margin		0.15 – 30MHz 0 – 2 KHz
	Radiated emissions	EN55022	A – 6dB margin		30 – 10000MHz
AC Input Immunity	Line surge		3 x V_{NOM} 480V	B	1 Φ only or all 3Φ
	Line sags and interruptions	EN61000-4-11		A	-30%, 10ms
				B	-60%, 100ms
				B	-100%, 5sec
		Output will stay above 40V_{DC} @ full load Sag must be higher than 80Vrms.		A A	25% sag for 2 sec 1 cycle interruption
	Lightning surge	EN61000-4-5, Level 4, 1.2/50µs – error free		A	4kV, comm
				A	2kV, diff
		ANSI C62.41-2002 100kHz ring wave 1.2/50µs-8/20µs 550ns EFT burst	3, Category B 3, Category B	B, Table 2 B, Table 3 B, Table 7	6kV/0.5kA 6kV, 3kA 2kV, severity II
	Fast transients	EN61000-4-4	3	A	5/50ns, 2kV (common mode)
Enclosure immunity	Conducted RF fields	EN61000-4-6	3	A	130dBµV, 0.15-80MHz, 80% AM
	Radiated RF fields	EN61000-4-3	3	A	10V/m, 80-1000MHz, 80% AM
		ENV 50140		A	
	ESD	EN61000-4-2	4	A	8kV contact, 15kV air

Criteria — Performance
- A — No performance degradation
- B — Temporary loss of function or degradation not requiring manual intervention
- C — Temporary loss of function or degradation that may require manual intervention
- D — Loss of function with possible permanent damage

[7] Designed to start and work at an ambient as low as -40°C, but may not meet operational limits until above -5°C

[8] The maximum operational ambient is reduced in Europe in order to meet certain power cord maximum ratings of 70°C. The maximum operational ambient where 70°C rated power cords are utilized is reduced to 60°C until testing demonstrates that a higher level is acceptable.

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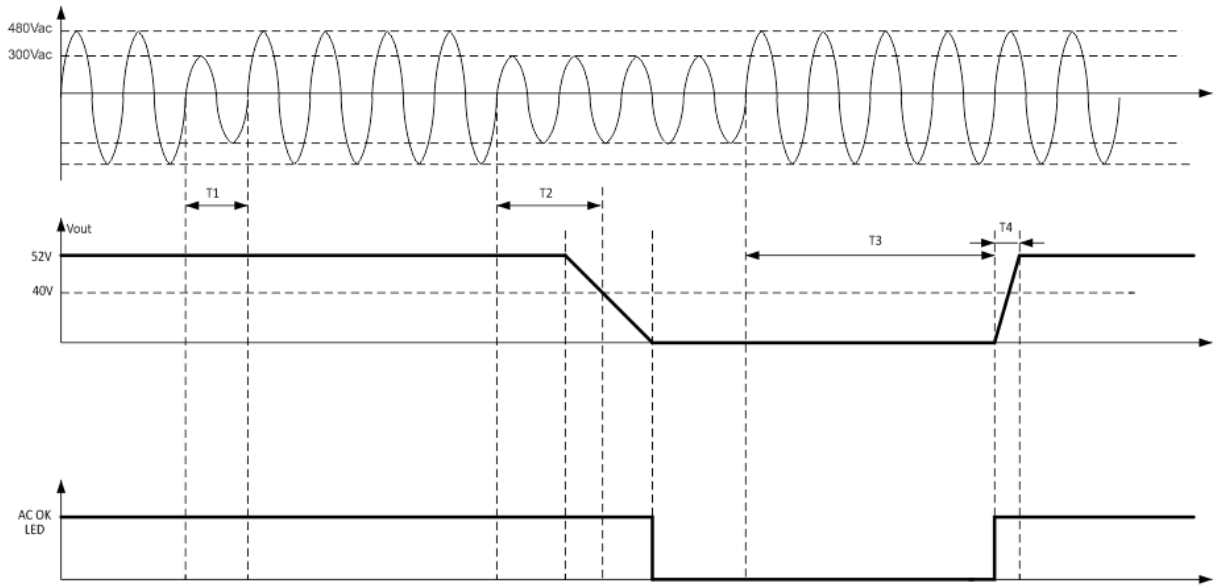
3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

Timing diagrams

Response to input fluctuations



T1 – ride through time – 0.5 to 1 cycles [10 – 20ms] V_{OUT} remains within regulation – load dependent

T2 – hold up time - 15ms – V_{OUT} stays above 40V_{DC}

T3 – delay time – <5s – from when the AC returns within regulation to when the output starts rising

T4 – rise time – varies according to output loading, up to 8 seconds at full load

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3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

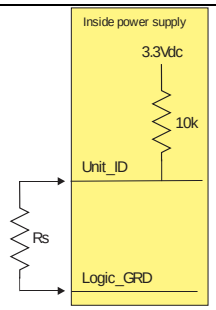
Control and Status

This Rectifier incorporates the GE Galaxy, RS485 based, protocol. GE will provide separate documentation on the Galaxy RS485 based protocol for users desiring to interface to the rectifier. Contact your local GE representative for details.

Control Signals

Bay_ID[9]: Up to 10 different units are selectable.

A voltage divider between 3.3V and Logic_GND configures Unit_ID. Internally a 10kΩ resistor is pulled up to 3.3VDC. A pull down resistor Rs needs to be connected between pin Unit_ID and Logic_GND.



Bay_ID	Voltage level	R_S (± 0.1%)
Invalid	3.30	
1	3.00	100k
2	2.67	45.3k
3	2.34	24.9k
4	2.01	15.4k
5	1.68	10.5k
6	1.35	7.15k
7	1.02	4.99k
8	0.69	2.49k
9	0.36	1.27k
10	0	0

Device address in RS485 mode: The address in RS485 mode is divided into two components; Slot_ID and Shelf_ID

Slot_ID: Up to 10 different modules could be positioned across a 19" shelf if the modules are located vertically within the shelf. The resistor below needs to be placed between Slot_ID and Vout (-). Internal pull-up to 3.3V is 10kΩ.

Slot	Resistor	Voltage	Slot	Resistor	Voltage
invalid	none	3.3V	6	7.15k	1.35V
1	100k	3V	7	4.99k	1.02V
2	45.3k	2.67V	8	2.49k	0.69V
3	24.9k	2.34V	9	1.27k	0.36V
4	15.4k	2.01V	10	0	0
5	10.5k	1.68V			

Shelf_ID: When placed horizontally up to 20 shelves can be stacked on top of each other in a fully configured rack. The shelf will generate the precision voltage level tabulated below referenced to Vout (-).

Shelf	V_{MIN}	V_{NOM}	V_{MAX}
Fault	0	0	0
1	1.21	1.23	1.24
2	2.42	2.45	2.48
3	3.63	3.68	3.72
4	4.84	4.90	4.96
5	6.06	6.13	6.20
6	7.27	7.35	7.43
7	8.48	8.58	8.67
8	9.69	9.80	9.91
9	10.90	11.03	11.15
10	12.11	12.25	12.39
11	13.32	13.48	13.63
12	14.53	14.70	14.87
13	15.74	15.93	16.11
14	16.95	17.15	17.35
15	18.17	18.38	18.59
16	19.38	19.60	19.82
17	20.59	20.83	21.06
18	21.80	22.05	22.30
19	23.01	23.28	23.54
20	24.22	24.50	24.78

Interlock[10]/Interlock2: This is a short pin utilized for hot-plug applications to ensure that the rectifier turns **OFF** before the power pins are disengaged. It also ensures that the rectifier turns **ON** only after the power pins have been engaged. Must be connected to V_OUT (-) for the rectifier to be ON.

8V_INT: Single wire connection between modules, provides redundant bias to the DC/DC control circuitry of an unpowered module.

LEDs

Three LEDs are located on the front faceplate. The AC_OK LED provides visual indication of the INPUT signal function. When the LED is ON GREEN the rectifier input is within normal design limits.

The second LED is the DC_OK LED. When GREEN the DC output is present. When 'blinking' a power limit or overload condition exists. When OFF the output is not present.

The third LED is the FAULT LED. A continuous RED condition indicates a fault. Blinking of the RED LED indicates loss of communications.

[9] Bay_ID and Unit_ID are the same signals.

[10] Dual functionality of Slot_ID and Interlock

Table 2: Alarm and LED state summary

	Rectifier LED State				Monitoring Signals[13]		
Condition	AC OK Green	DC OK Green	Fault Red		Fault		Module Present
OK	1	1	0		HI		LO
Thermal Alarm (5°C before shutdown)	1	1	Blinks		HI		LO
Thermal Shutdown	1	0	1		LO		LO
Defective Fan	1	0	1		LO		LO
Blown AC Fuse in Unit	1	0	1		LO		LO
AC Present but not within limits	Blinks	0	0		HI		LO
AC not present[11]	0	0	0		HI		LO
Boost Stage Failure	1	0	1		LO		LO
Over Voltage Latched Shutdown	1	0	1		LO		LO
Over Current	1	Blinks	0		HI		LO
Non-catastrophic Internal Failure[12]	1	1	1		LO		LO
Missing Module							HI

[11] This signal is correct if the rectifier is back biased from other power supplies in the shelf .
[12] Any detectable fault condition that does not cause a shutting down. For example, ORing FET failure, boost section out of regulation, etc.
[13] Signal transition from HI to LO is output load dependent

Table 3: Signal Definitions

Signals are referenced to Logic_GND unless otherwise stated.

Function	Label	Type	Description
Module Present	MOD_PRES	Output	Short pin, Connected to Logic_GND notifies the system that module is present,
Slot Address/Interlock	Slot_ID INTERLOCK	Input	Short pin referenced to Vout(-) . This signal provides the last-to-make and first-to-break function to properly control the rectifier for hot plug and hot disengagement. A voltage level identifies the rectifier slot address in a shelf.
Shelf Address	Shelf_ID	Input	A voltage level referenced to Vout (-) identifies the shelf address
Bay Address	Bay_ID	Input	
DC-DC Back bias	8V_INT	Bi-direct	Used to back bias the DSP from other operating Power supplies. Ref: Vout (-).
Interlock2	INTERLOCK2	Input	A short pin referenced to Logic_GND. This signal provides a second interlocking feature of last-to-make and first-to-break function to properly control the rectifier for hot plug insertion and disengagement.

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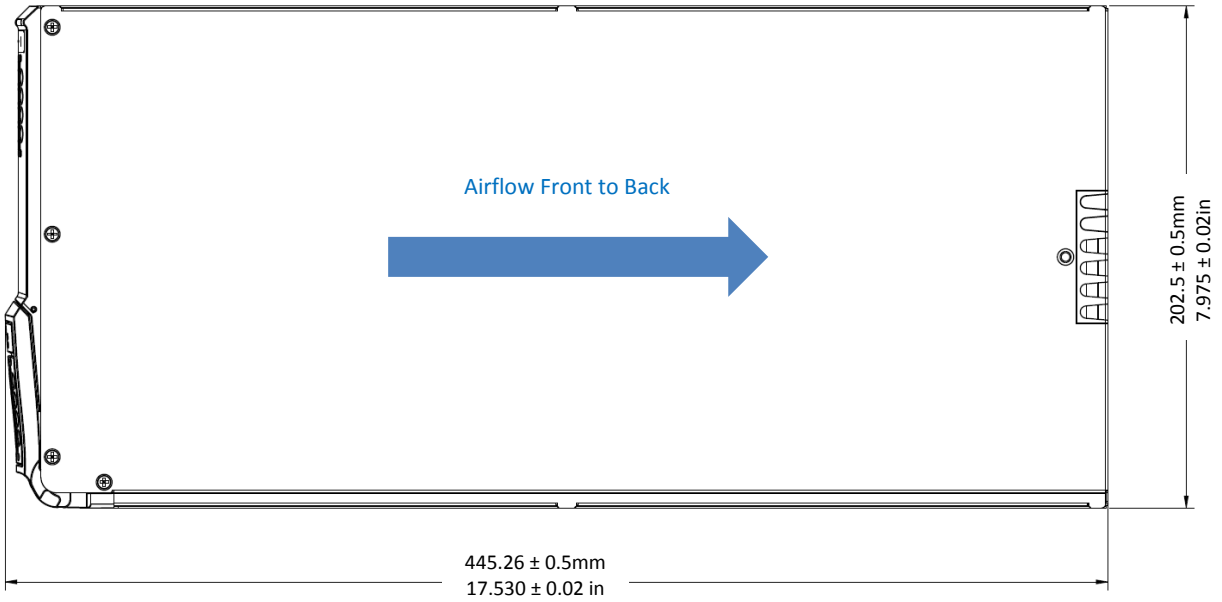
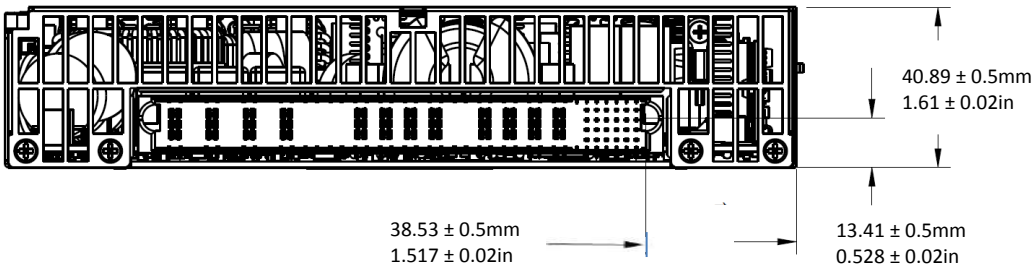
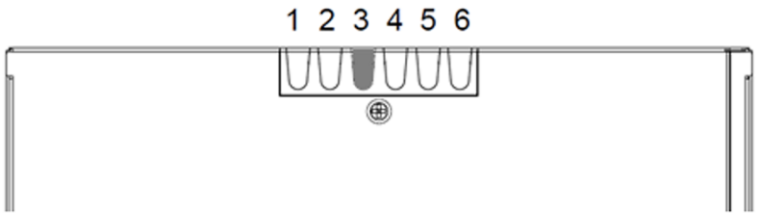
Mechanical Outline



Top View [Note: add safety label to side of unit per UL, EC directives, TUV, Power Systems Practices]



Rear View



Keying

Product	Keying Location Knotched
GP communications	3

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

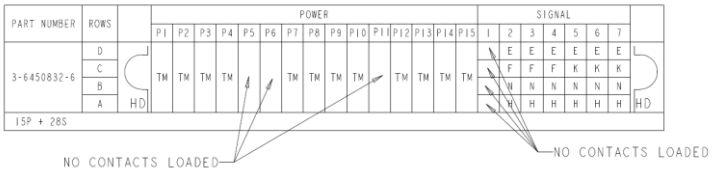
Front View: Faceplate Color: Spattered Finish CO White (OS11148)

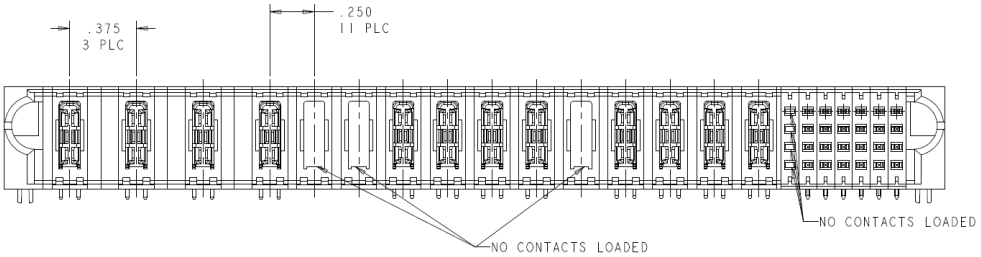
Front Panel LEDs

Symbol	Color	Function
~		**ON:** Input ok **Blinking:** Input out of limits
!		**ON:** Fault **Blinking:** loss of communications
⎓		**ON:** Output ok **Blinking:** Overload

Mating Connector

Rectifier side: Tyco 3-6450832-6





AC INPUT						DC OUTPUT								
P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
L1	L2	L3	Frame Gnd	Empty	Empty	Vout +	Vout +	Vout +	Vout +	Empty	Vout -	Vout -	Vout -	Vout -

SIGNALS							
1	2	3	4	5	6	7	
Empty	SLOT_ID INTERLOCK		Bay_ID		RS485-	RS485+	D
Empty	SHELF_ID			MOD_PRES		LOGIC_GND	C
Empty	8V_INT						B
Empty			INTERLOCK2				A

PWB

Notes:

= Short Pin

= System side mating connector must have its Frame GRD pin the longest to ensure that it is mating first.

= Slot location

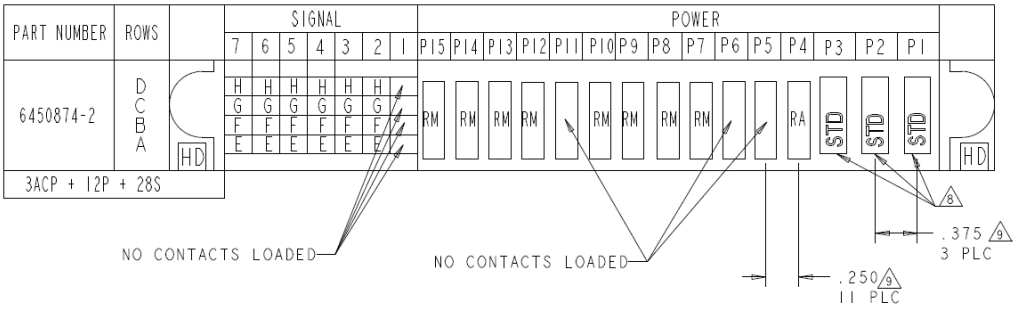
Pin out as looking straight at the connector

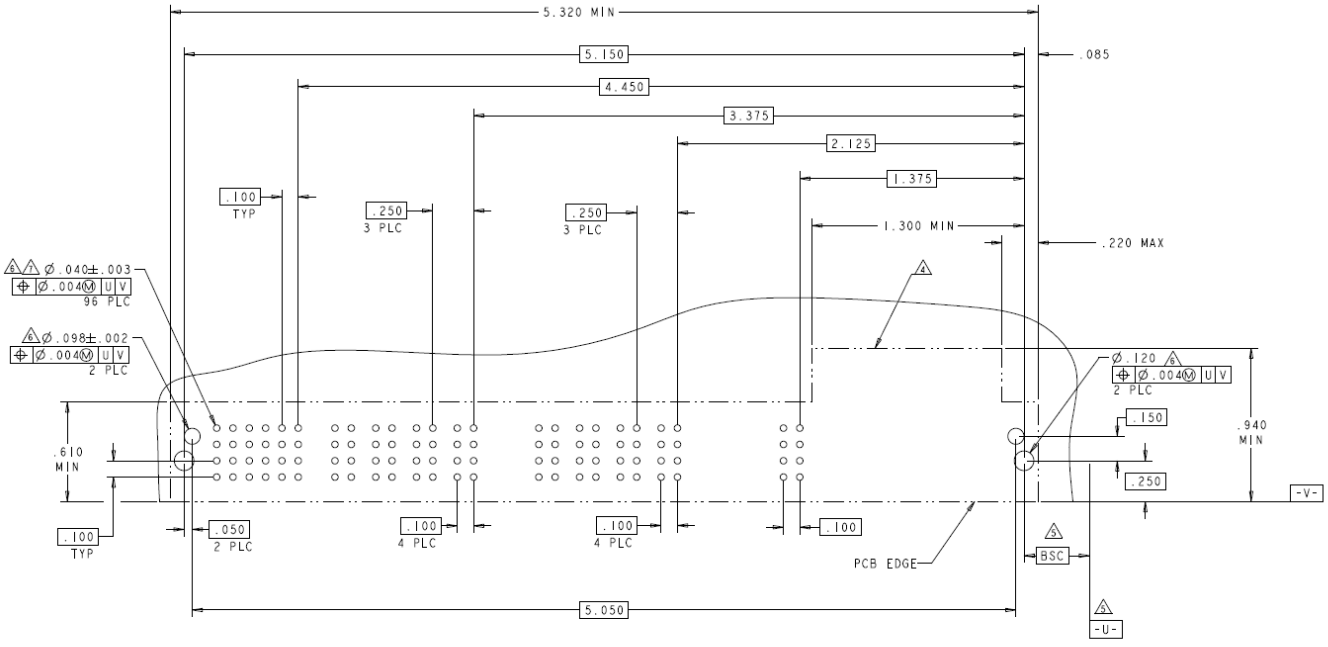
SIGNALS							
1	2	3	4	5	6	7	
Empty	SLOT_ID INTERLOCK		Bay_ID		RS485-	RS485+	D
Empty	SHELF_ID			MOD_PRES		LOGIC_GND	C
Empty	8V_INT						B
Empty			INTERLOCK2				A

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

System side receptacle: Tyco soldered version: 6450874-2
press-fit version: 6450884-2
AC power contact: 1-1600961-8 (3X)
AC power contact secondary lock: 1600903-1 (3X)



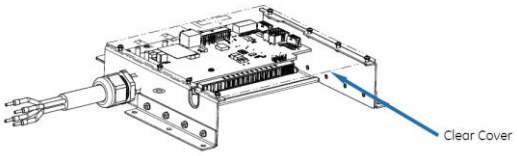


RECOMMENDED PCB LAYOUT

GP100H3R48TE Global Platform Line High Efficiency Rectifier

3Φ-380/480V_{AC} input; Default Output: ±52/48V_{DC} @ 6000W

Accessories

Item	Description	Part number
	1u_GP100_interface: Rectifier interface board. This debug tool can be used to evaluate the performance of the rectifier. The input interface is a set of 4 wires, 3-phases and a frame ground connection. The output is a set of DC lug landings. See the installation guide for further information.	150044268
	1u_GP100_interface Installation Guide	850048307
	Designed to mount into standard 19" EIA-310-D racks, these GE shelves provide a turn-key solution for customers. The selection guide is documented on the GE website.	See GE website

Ordering Information

Please contact your GE Sales Representative for pricing, availability and optional features.

Item	Description	Comcode
GP100H3R48TEZ	110A rectifier with isolated RS485 communications, 52.5Vdc default	150034309
GP100H3R48TEZ-IN	110A rectifier with isolated RS485 communications, 48Vdc default	150045497