

Product Features

- High power density: 19.2W / inch delta; 1160W/L
- Constant output power
- Fits in 19" high, ETSI compliant
- Wide input range (90VAC – 280VAC)
- Outdoor operating temperature range
- Active load sharing / redundancy diode
- CAN-Bus enabled



Benefits



When space in a 300mm / (11.8") deep cabinet is an issue

With value above W/L, (18.W/cubic inch) up to 55°C / (131°F), this rectifier demonstrates superior power density. The low 1U profile fits the rack in a standard cabinet leaving lots of space for the application. The rectifier is primarily designed for application running in 300mm (11.8") deep cabinet.

Fully featured

The rectifiers and systems offer a wide range of features to improve control of the system. Beyond the traditional AC and DC fault control, the unit is equipped with a smart derating of the power in regards to intern temperature. Signals include output current readout, remote on/off, voltage programming, single wire active load sharing.

Excellent reliability

The rectifiers are designed to work in parallel. Redundancy diode on the output allows for hot swap fault tolerant insertion. Each unit is protected against input under voltage and stands up to 300V without damage, output over voltage, smart output power limitation, over temperature. Combined with the high conversion efficiency and MTBF of 300 000 hours per Bellcore RPP standard this protection secures excellent system availability.

Fit for worldwide usage

The units work with a universal input. Active PFC secures low level of harmonics> Units are certified against all major worldwide requirements, UL, CSA and CE marking.

Easy installation and maintenance

The rectifiers do not require any specific procedure or any special tools to be installed in the rack. A led on the front plate immediately signals the proper working of the unit, failures or degraded mode, resulting in very simple and quick maintenance.

CAN enabled

The retifier can be monitored and controlled through analogue signals. It is also equipped with a CAN signal bus.

1 Standards / Approvals

Certification

UL / CSA 60950-1
 EN60950 : CE marked for low voltage directive

The power supply is designated as a class 1 apparatus. The protective earth terminal must be connected.
 Leakage current : max. 3.5mA at 264V/50Hz

Dielectric strength test (on every unit):

Input - output: 4800VDC
 Input - earth: 3000VDC
 Output - earth: 2200VDC

2 EMC Data

2.1 CE marked for EMC directive

Port	Phenomena	Frequency	Limits	Reference standard
AC input	Conducted	150kHz - 30MHz,	B	EN 55022
	Harmonic current	0-2kHz	-	EN61000-3-2
Enclosure	Radiated E field	30 - 1000MH	B	EN 55022

2.2 EMC - Emission

Port	Phenomena	Test	Frequency	Criteria	Reference standard
Enclosure	RF electromagnetic field Amplitude modulated	3 V/m 80% AM	80MHz to 1GHz 1kHz mod	A	EN61000-4-3
	RF electromagnetic field keyed carrier	3 V/m 50% duty	900MHz 200Hz	A	ENV50204
	ESD	8 kV air 4kV contact		B	EN61000-4-2
AC Input	RF common mode, Amplitude modulated	3 V 80% AM	150kHz to 80MHz 1kHz	A	EN61000-4-6
	Burst/Fast transients Common mode	1kV Tr=5ns/Th=50ns	5kHz	B	EN61000-4-4
	Surge Line to ground Line to line	Tr=2.2µs/Th=50µs 2KV 1KV		B	EN61000-4-5
	Voltage dips	-30%, 10ms -60%, 100ms		B C	EN61000-4-11
	Voltage interr.	>95% 5s		C	

3 Environmental Data

Parameter	Conditions	Min.	Nom.	Max.	Unit
Operating Ambient Temperatures	Operating (forced air)	-20/(-4)		70/(158)	°C/(°F)
	Starts (20% load max.) degraded mode	-40/(-40)			°C/(°F)
	Integrated power derating 2%/°C	55/(131)		70/(158)	°C/(°F)
Storage Temperature	Storage and transit	-40/(-40)		85/(185)	°C/(°F)
Operating Humidity	Non-Condensing (for optional continual cooling contact factory)	20		80	%
Storage Humidity	Storage and transit	10		95	%
Operating Altitude				3000/(10000)	m/(feet)
		70/(9.2)		110/(15.6)	kPa/(psi)
Storage Altitude				12000/(40000)	m/(feet)
Vibration	Non-operating: Constant amplitude: 0.15mm Constant acceleration: 2g	10		60	Hz
		60		150	Hz
Shock	IEC 68-2-27, MIL-STD-810E			10	g
Reliability	25°C, 850W Bellcore Rpp		300000		hours
Acoustic noise	NEBS, ETS 300 753			49	dBA

4 Electrical data

4.1 Input data

Parameter	Conditions	Min.	Nom.	Max.	Unit
Input Voltage	With derating	90		265	V
Turn-On Voltage		80		90	V
Turn-Off Voltage					
Low	Low	70		82	V
High	High, can stand 300V without damage	280		290	V
Input Frequency		47		63	Hz
Inrush Current	Per ETS300 132 Cold and hot start			20	Amps
Input Current	230VAC @ 850W 110VAC @ 500W, 90VAC @ 500W nominal load		4.25 6.8	5.8 7.6	Amps Amps
Input Protection	One in line 5 x 20mm			10	Amps
Operational Efficiency	230VAC, nominal load		90		%
	High range	90			%
	Low range	85			%
Power Factor	Reference source voltage, nominal load	0.99			
	Any allowed input voltage, nominal load	0.95			
Leakage Current				3.5	mA
Hold-Up Time	Ref. voltage at 0°sinewave, nominal load	10			ms

4.2 Output data

Parameter	Conditions	Min.	Nom.	Max.	Unit
Output Voltage (Setpoint)		53.9	54	54.1	V
Control Range		40		58	V
Output Power	High input range		850		Watts
	Low input range		500		Watts
Output Current	High line (230VAC 54V)	0	15.7		Amps
	Low line (110VAC 54V)	0	9.3		Amps
Line Regulation				±0.1	%
Load Regulation				±0.5	%
Temp Regulation	Between -20°C and 70°C			1	%
Ripple Noise & Frequency					
Wideband noise	According to ETS 300 132-2			2	mVrms
Psophometric				10	mVrms
Flat/Unweighted					
Dynamic Response	Min. load 0.5A			1	V
Overshoot	5A load change			4	ms
Recovery time	dl/dt 0.5A/μs				
Turn-On Overshoot				0.5	V
Recovery				2	ms
Turn-On Delay	90V full range			1.5	s
Remote On Delay Time				500	ms
Remote Off Delay Time				300	ms
Over-Current Protection	Constant power limitation			20.3	A
Short Circuit Protection	Latching after 10 sec			25	A
Over-Voltage Protection		59.5		60	V

5 Monitoring

5.1.1 Visual

Function	Description
Normal operation	Green
Output fail	Red (out of range, overvoltage protection)
Power supply stop	Red flashing (no power delivered, short circuit, over temperature)
Degraded mode	Orange (power derated)

5.1.2 Signals (see drawing for pin assignment)

Function	Description
0V signal	All signals are referenced to the "0V signal" The maximum voltage difference between 0V signal and power output 0V (OUT+) is $\pm 3V$
Current sharing	Provided via an analogue bi-directional signal, single wire connection; provides $\pm 10\%$ sharing accuracy
Output current reading	The units feature a voltage signal proportional to the output current (0,1V/A)
AC OK	Digital signal delivered when the mains voltage is in the specified input voltage range. (90-265Vac) (PNP open collector, active high, 10V/5mA)
AC High mains	Digital signal delivered when the mains voltage is in the specified high mains range (PNP open collector, active high, 10V/5mA)
DC OK	Digital signal delivered when the output voltage is above -39.5V (PNP open collector, active high, 10V/5mA)
Temperature OK	digital signal delivered indicating that the unit is within normal operating limits (PNP open collector, active high, 10V/5mA)
Module missing	Digital signal delivered when the power supply is present (active low: strap to 0V Signal)

6 Control signals

Function	Description
Output voltage programming	The output voltage of the rectifier can be driven by an analogue signal $V_{out} = -40V - 4 \times V_{prog}$
Remote ON/OFF	Input signal; the power supply is ON when a 10 k resistor is present between the ON/OFF pin and the 0V signal; it is OFF when the pin is tied (shorted) to 0V Signal Cycling this signal resets the overvoltage protection memory

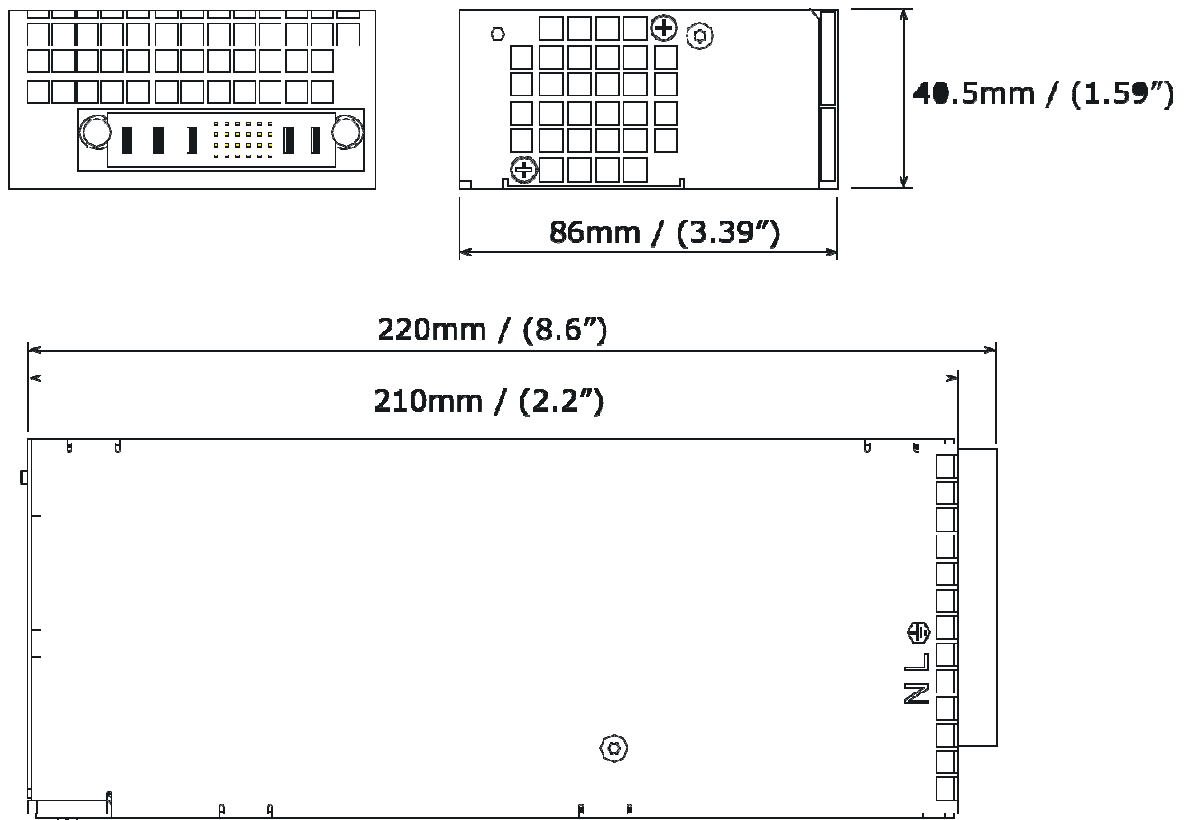
7 Protections

Function	Description
Mains Input fuse in the line Type 5x20mm 10AI Mains out of range Undervoltage Overvoltage	The power supply switches off when the mains voltage goes below the specified range. The power supply restarts when the mains returns within the specifications Power supply operates up to 280VAC and stand 300VAC without damage
Output Output overvoltage Overload	The power supply switches off when voltage on output exceeds 59V. During an overvoltage condition the power supply is switched OFF in a latching state: reset is achieved by recycling the AC mains The power supply is protected against overload condition. The current is limited to 21.3A Power supplies resume normal operation when overload is removed. Power supply is protected against short timeout currents at 25A. Protection is latching after 10 seconds
Smart power derating	Output power is decreased for ambient temperature is above 55°C. Derating slope is around 2% per degree Celsius or 1.1% per degree Fahrenheit up to 70°C

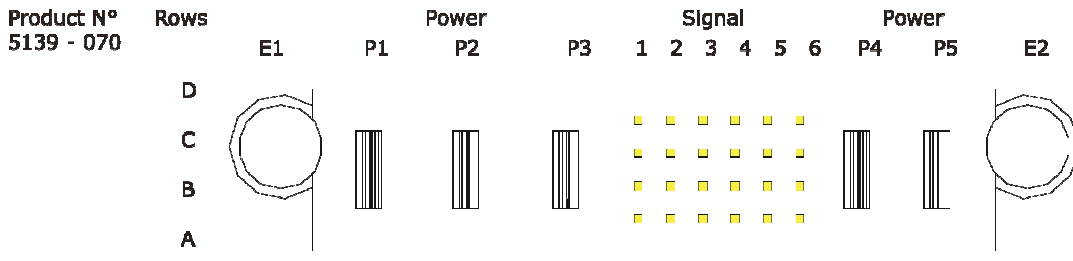
Function	Description
Thermal shutdown	The power supply switches off when the safety inner temperature is exceeded. The power supply restarts when the internal temperature returns within safe conditions. AC recycle does not clear an over temperature condition
Hot swap	The power supply is designed with an internal redundancy diode. When mounted in parallel, power failure of any module will not impact on the operation of the other modules

8 Mechanical Specifications

Rectifier CAR0948TN Outline Dimensions



Parameter	Description
Dimensions (HWD)	40.5mm / (1.59") x 86mm / (3.39") x 210mm / (8.27")
Weight	1.1kg / 2.4lbs
Mounting	Hot plugging allowed. The PS is automatically locked when introduced into the rack. To remove, a small handle enables user to unlock and extract the unit. The unit can be mounted in any direction
Connector	FCI Berg P/N: 51939-070, Mates with FCI Berg P/N: 51915-050



Rectifier Pin Assignment (see drawing):
 Connector DIN41612 Type C male 3 x 32

Pin	Function	Pin	Function	Pin	Function	Pin	Function	Pin	Function
A1		B1	TEMP OK	C1	0V signal	D1	I READOUT	P1	N
A2		B2	Reserved	C2	AC HIGH	D2	0V signal	P2	L
A3		B3	Reserved	C3	AC OK	D3	INHIBIT	P3	PE
A4		B4	Reserved	C4	SHARING	D4	U PROG	P4	0V
A5	Reserved	B5	0V signal	C5	DC OK	D5	REMOTE ON / OFF	P5	-54V
A6	Reserved	B6	0V signal	C6	CAN-L	D6	CAN-H	P6	

9 Product overview and ordering information

Description	Order Number
Rectifier -48V 850W Cardboard dimensions (HWD) Weight Net weight rectifier	CAR0948TN 160mm x 190mm x 420mm / (6.3 " x 7.5" x 16.5") 3.5kg / (7.72lbs) 1.1kg / (2.43lbs)
Power rack for four rectifiers Cardboard dimensions Weight Net weight rack	ACE094ST.L48N mm x mm x mm / (" x " x ") kg / (lbs) kg / (lbs)