

Product Features

- Power module telecom applications
- Fits in 19" high 1.6U or 3U high
- Hot pluggable, fault redundant
- Active load sharing
- Wide input range
- Wide operating temperature range



Benefits

Constant output power

A true constant power with 90% typical efficiency (including redundancy diodes) for this 1000W rectifier demonstrates the combination of the long experience of Mitra Innovations for distributed power architecture with the latest development in technology to offer 5000W with redundancy in a 19" 6U space. Constant output power is the ideal fit the load of the networks, typically dc/dc converters. It also supplies more current at low voltages a real need when batteries are discharged.

Fully featured for all applications

The units are perfect solutions to both indoor and outdoor applications and offer a wide range of features to improve control of the system. Beyond the traditional voltage programming, AC and DC fault control, the unit is equipped with a smart de-rating of the power in regard to internal temperature. Signals include thermal shutdown, AC mains range detection (low or high) over voltage module missing and offer great flexibility of system configuration.

Excellent reliability

Combined with the latest manufacturing technologies and statistical process control techniques, the rectifiers are designed to work in parallel. Active single wire sharing secures a very good load share among units. Redundancy diode on the output allows for hot swap fault tolerant insertion. Each unit is protected against input under and over voltage, output over voltage, smart output power limitation, over temperature.

Easy installation and maintenance

The rectifiers do not require any procedure or any special tools to be installed in the rack. Four leds on the front plate allow to rapid detection of operation and faults and makes system maintenance very simple.

1 Safety

Certification

CE marked for low voltage directive
EN 60950-1

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: 4300VDC
Input - earth: 2700VDC
Output - earth: 4300VDC

2 EMC Data

CE marked for EMC directive

2.1 Emission

Port	Frequency	Limits	Reference standard
AC Input (conducted)	0.15MHz - 30MHz	B	EN 55022 FCC Docket 20780 Part 15 Sub part J Class B
	0 - 2 kHz	-	EN 61000 - 3 - 2
Enclosure (radiated)	30 - 230 MHz	B	EN 55022
	30 - 1000MHz		

2.2 Immunity

Port	Phenomena	test	Criteria	ref.standard
Enclosure (radiated)	Conducted RF fields Immunity	130 dB μ V 0.15 MHz - 80 MHz (80 % AM)	A	EN 61000-4-6 (level 3)
	Radiated RF fields Immunity	10 V/m 80 MHz - 1000 MHz (80 % AM)	A	EN 61000-4-3 (level 3)
			A	ENV 50140
ESD	8 KV air 6 KV contact	B	EN 61000-4-2	
AC input	Fast transients Common mode	(5/50 ns) 2 KV	B	EN 61000-4-4 (level 3)
	Voltage dips	-30 %, 10 ms	B	EN 61000-4-11
	Voltage interr.	-60 %, 100 ms	C	
			-100%, 5000ms > 95 % 5 s	C
Surge common mode differential mode	(1.2 / 50 μ s) 2 KV 1 KV	A	EN 61000-4-5	

3 Environmental Data

Parameter	Conditions	Min.	Max.	Unit
Temperature range	Operating (forced air)	-25/(-13)	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 and transit	-40/(-40)	85/(185)	°C/(°F)
Relative humidity	Operating non-condensing	30	95	%
	Storage and transit	10	95	%
Altitude	Operating	70(9.2)	2000/(8200) 110/(15.6)	m/(feet) kPa/(psi)
	Storage and transit	30(4.3)	12000/(39400) 110/(15.6)	m/(feet) kPa/(psi)
Vibration	IEC68-2-64 (random) Operating: 20Hz-2000Hz Acceleration: Duration:		6 30	grms minutes
Shock	IEC-68-2-27, MIL - STD - 810E		20	grms
Acoustic noise	Variable speed Meets ETSI spec		49	dBa

4 Electrical data

4.1 Input data

Parameter	Conditions	Min.	Nom.	Max.	Unit
Input voltage		90	110	130	V
Low operating range		88			
Start		180	230	264	V
High operating range				275	V
Stop					
Frequency		47		63	Hz
Source current	90VAC, 1000W load			13.5	A
Inrush current	Complies with ETS 300 132			35	Ap
Start-up time and overshoot	No overshoot		1	3	s
Power factor	50Hz, nominal load	0.95	0.99		
Harmonics	EN61000 - 3 - 2				
Efficiency	110VAC, 1000W load	85			%
	230VAC, nominal load		90		%
Input fuses	2 fuses Type 3AB axial		15 (250V)		A

4.2 Output data

Parameter	Conditions	Min.	Nom.	Max.	Unit
Output Voltage					
Factory pre-set	At 25°C, nominal load	26.9		27.1	V
Range		20		29	V
Overshoot protection		29.75		30.25	V
Output power				1000	W
Output current	Uo = 27V	0	37		A
	Uo = 25V	0	40		A
Current limit	No current tail before 10V			40	A
Short circuit protection	Non latching			50	A
Regulation	Any combination of load and line			150	mV
Temperature drift				0.2	% / °C
				0.11	% / °F
Dynamic operation					
Overshoot	Minimum load 20%			1	V
Recovery time	Load change step : 50%			4	ms
Peak to Peak ripple				250	mVpp
Narrow band noise	Meets ETS 300 132 - 2 § 4.8				
Wide band noise	ETS 300 132 - 2				
RMS	Non weighted			5	mVrms
Psophometric	Weighted			2	mVrms
Hold-up time	Nominal load	20			ms

5 Protections

The rectifier is protected against the following failures:

Mains:

Input fuses, one in each line Type 3AB axial

Mains out of range. The power supply switches off when the mains voltage goes beyond the specified range. In this case, the green led AC good is switched off on the front panel and a specific alarm is generated. The power supply restarts when the main returns within the specifications.

Under voltage: Power supply starts at 88VAC; stops at 82VAC

Over voltage: Power supply stops at 275VAC; restarts at 265VAC

Output:

Output overvoltage: The power supply switches off when voltage on output exceeds the specified overvoltage protection level.

The red led Output Over voltage is illuminated on the front panel. During an overvoltage condition the power supply is switched OFF in a latching state: reset is achieved by recycling the AC mains.

Overload: The power supply is protected against overload condition. Power supplies resume normal operation when overload is removed.

Smart power derating:

Output power is decreased for ambient temperature at above 55°C . De-rating slope is around 2% per 1° Celcius or 1.1% per 1°Fahrenheit up to 70°C / (158°F).

Thermal shutdown:

The power supply switches off when the safety inner temperature is exceeded (typical 110°C/230°F). During a thermal shutdown condition the red led (Excessive Temperature) is illuminated on the front panel and a specific alarm is generated. The power supply restarts when the internal temperature returns within safe conditions (typical 95°C / (203°F)). AC recycle does not clear an over temperature condition.

Hot Swap:

The power supply is designed with an internal O-Ring diode in the +24V. When mounted in parallel, power fail of any module will not impact the operation of the other modules.

6 Signals

Signals are described for both power rectifiers and rack

Visual

AC good: Each rectifier is equipped with a green led on the front plate. Led switches off when AC is out of range.

DC good: Each rectifier is equipped with a green led on the front plate. Led switches off when no power is available

Thermal Shutdown: A red led switches on when the inner temperature has reached its limit.

Output overvoltage: A red led switches on when the output voltage is between 29.75V and 30.25V.

Monitoring signals (See drawings for pin assignment)

0V signal: All signals are referenced to the "0V signal". The maximum voltage difference between 0V signal and power output 0V (OUT) is $\pm 3V$.

5V standby: Isolated standby voltage that may be used to power circuits that require power during the powered-down state or for housekeeping circuitry. Maximum current: 500mA.

5V standby return: Signals described hereafter are related to 5V standby return. 5V standby return is isolated from 0V power and 0V signal.

Current sharing: internal to the rack. Provided via an analogue bi-directional signal single wire connection; provides $\pm 10\%$ sharing accuracy.

Output current reading: the unit features 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 to 265VAC). (PNP open collector, active high, pull-up to 5V standby)

AC high mains: Digital signal delivered when the mains voltage is above 180V. (PNP open collector, active high, pull-up to 5V standby).

DC OK: Digital signal delivered when the output voltage is above 18V. (PNP open collector, active high, pull-up to 5V standby).

Temperature OK: Digital signal delivered indicating that the unit is within normal operating limits. (PNP open collector, active high, pull-up to 5V standby).

Missing Module : Digital signal delivered when the power supply is present (active low: strap to 5V standby return).

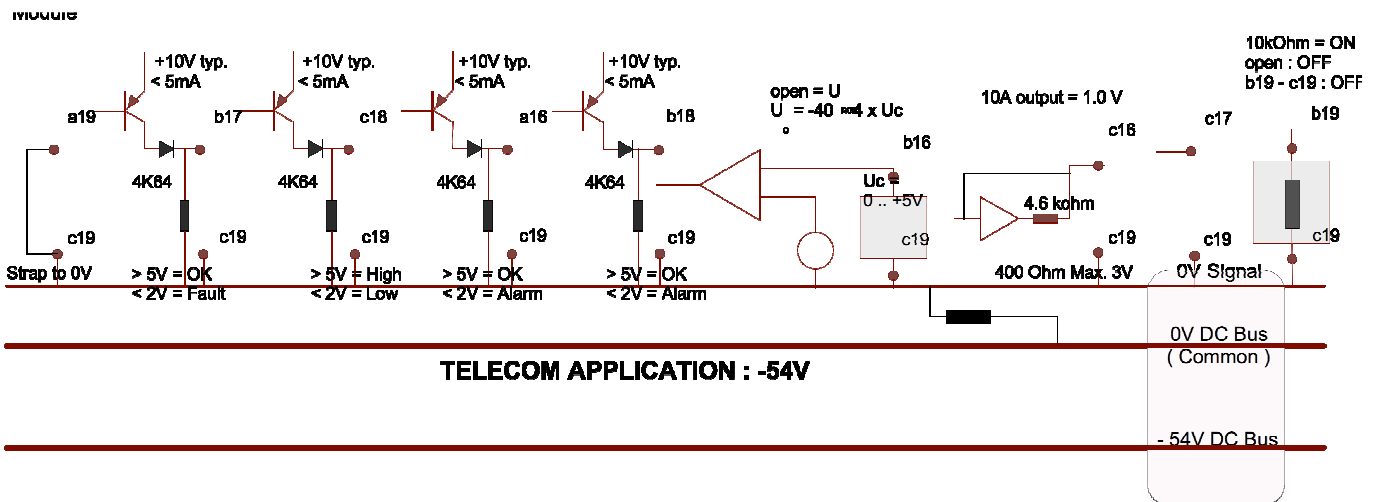
Control signals

Output voltage programming. The output voltage of the rectifier can be driven by an analogue signal. $U_{out} = 20V + 2 \times U_{prog}$.

Remote ON/OFF: Input signal; the power supply is ON when a 10kOhm resistor is present between the ON/OFF pin and the 5V standby return; it is OFF when the pin is left unconnected or tied (shorted) to 5V standby return.

Cycling this signal resets the overvoltage protection memory.

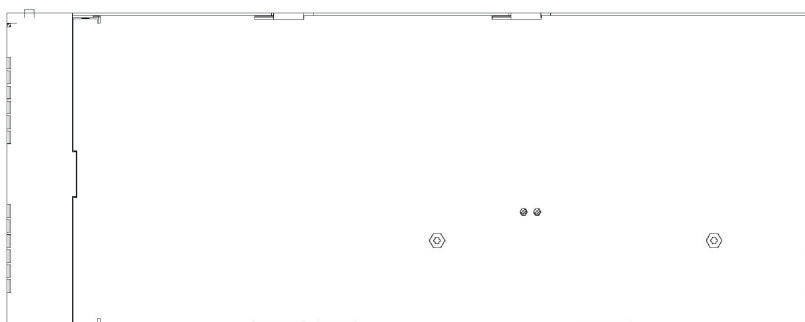
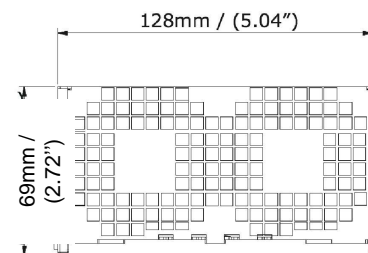
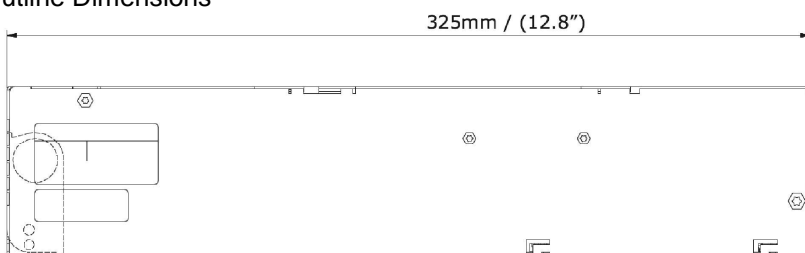
7 Signals schematic



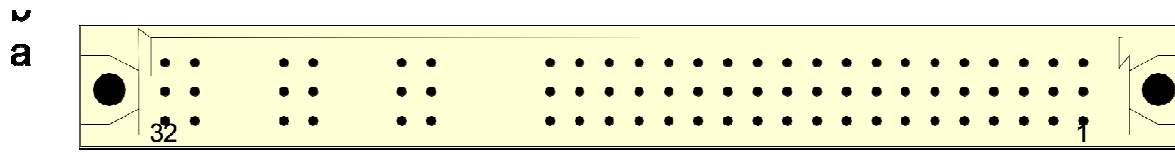
8 Mechanical Specifications

8.1 Rectifier CAR1024TP

Outline Dimensions



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



Rectifier Pin Assignment

#	Function	#	Function	#	Function
a1 - a7	OUT - [0V]	b1 - b7	OUT - [0V]	c1 - c7	OUT - [0V]
a8	Do not connect	b8	Do not connect	c8	Do not connect
a9 - a15	OUT + [+24V]	b9 - b15	OUT + [+24V]	c9 - c15	OUT + [+24V]
a16	DC OK	b16	Voltage Program	c16	Current monitoring
a17	5V standby	b17	AC OK	c17	Sharing
a18	5V standby return	b18	Temperature OK	c18	AC High
a19	Missing module	b19	Remote ON/OFF	c19	0V signal
a20 - a22	REMOVED	b20 - b22	REMOVED	c20 - c22	REMOVED
a23 - a24	LINE	b23 - b24	LINE	c23 - c24	LINE
a25 - a26	REMOVED	b25 - b26	REMOVED	c25 - c26	REMOVED
a27 - a28	NEUTRAL	b27 - b28	NEUTRAL	c27 - c28	NEUTRAL
a29 - a30	REMOVED	b29 - b30	REMOVED	c29 - c30	REMOVED
a31 - a32	PE	b31 - b32	PE	c31 - c32	PE

9 Product overview and ordering information

Description	Order Number
Rectifier 1000W +27V	CAR1024TP
Cardboard dimensions	420mm x 190mm x 160mm / (16.54" x 7.48" x 6.30")
Net weight of rectifier	3,2kg / (7.05lbs)
Total weight	3,5kg / (7.72lbs)