

# **Comms260W AC/DC Power Supply**



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## 1 SUMMARY

This document describes the outline specification for a high reliability, +24V Output, 260W AC/DC PSU designed for Tuner Digitiser Systems, and other, multi-use applications. The PSU is mechanically arranged to fit within an available space envelope (WxLxH) of 90 x 175 x 85mm.

The PSU incorporates the latest high power density technology and adopts forced air-cooling with active fan speed control to minimise audible noise and maximise fan life.

The design approach has taken into consideration the specification for the unit to be capable of reliable operation within an extremely dusty environment.

A wide range, active power factor correction circuit is used to attenuate input harmonics ensuring minimal disturbance on the incoming mains supply and to generate a stabilised DC supply for the second stage DC-DC Converter. A high frequency DC-DC Converter is used as the second stage DC-DC Converter to generate the isolated +24Vdc Supply. The PSU is designed to incorporate additional EMI filtering on the input and output to attenuate noise to within the specification requirements of MIL-STD-461E.

## 2 GENERAL

<b>Format</b>	Fits within space envelope (WxLxH) of (WxLxH) of 90 x 175 x 85mm
<b>Technology</b>	HF Switch-mode Technology for Input PFC and DC-DC Converter sections
<b>Total output power</b>	260W maximum

## 3 ELECTRICAL

### 3.1 INPUT

AC Input Voltage Range	Operating: 100V–264V rms, Single phase.
Frequency	47 to 63 Hz.
R.M.S. Current at maximum power output	1.5A rms at 230Vac input 3.4A rms at 100Vac input
Efficiency, Vin=230V, Pout=200W	82% Typical 79% minimum
Peak Inrush Current	Less than 20A maximum.
Harmonic Distortion	Compliant with EN61000-3-2 THD: 5% typical, 10% maximum
Apparent Power Factor	95% Typical
Power	317W typical, 330W, maximum
Fusing	Unit incorporates fusing in both Live and Neutral Input Lines.

### 3.2 OUTPUT

Factory Set Voltage, Vout	24.0V
Adjustment Range	Fixed Output Voltage
Maximum terminal voltage	30V (27.5V typical over-voltage trip level)
Output Current Limit, I <sub>MAX</sub> <50°C ambient. V <sub>out</sub> =24V, V <sub>in</sub> >100V	11A<I <sub>MAX</sub> <17A
Output Short Circuit	The PSU is capable of sustaining a short circuit on its output for an indefinite period. During this condition, the current will be limited to 17A maximum. The PSU will automatically recover on removal of the short circuit condition.
Maximum Continuous Output Power	260W
Load Regulation, 0 - 100% load	+/-2% max
Line Regulation, 100V - 264V rms	+/-2% max
Hold Up time	5ms minimum
Output Over-voltage	30V - PSU shutdown - automatic re-try operation.
Temperature Coefficient	Less than 0.015% per °C (150ppm/°C)
Noise, Low Frequency, Frequency range 10Hz - 300KHz	100mV p-p max.
Noise, Broadband, Frequency range 10Hz - 100MHz	Complies with ETS300386:2001-09
System Noise Requirements	The PSU shall be designed to meet the requirements of MIL-STD-461E & MIL-STD-462 as applied to: - <ul style="list-style-type: none"> <li>a) Army Ground Mobile</li> <li>b) Navy Ground Mobile</li> <li>c) Air Force Aircraft Internal</li> <li>d) Ship Metallic Below Deck</li> </ul> (Lower limits apply)
Noise, Acoustic - Minimised by variable fan speed control	<54dBA

### 3.3 SIGNALS

#### 3.3.1 Signals

AC Healthy	Transistor collector output – activates (Output Voltage low, <0.8V) when input within normal limits. Vce withstand = 50V, sink current = 5mA max
Output (DC) Healthy	Transistor collector output – activates (Output Voltage low, <0.8V) when output within normal limits. Vce withstand = 50V, sink current = 5mA max
Current Limit Alarm	Transistor collector output – activates (Output Voltage low, <0.8V) when output normal (not in current limit). Vce withstand = 50V, sink current = 5mA max
Over-Temperature Alarm	Transistor collector output – activates (Output Voltage low, <0.8V) when unit within normal limits (not in over-temperature). Vce withstand = 50V, sink current = 5mA max
Fan Fail Alarm	Transistor collector output – activates (Output Voltage low, <0.8V) when fans running normally. Vce withstand = 50V, sink current = 5mA max
+5VE	+5V current limited supply to power external opto-couplers (Supplied via LM78L05)
GND	Common Return for +5VE and all transistor outputs. (referenced to 0VDC on Output Power Connector)



### 3.4 LED INDICATORS - size 3mm (Panel Mounted – Location near AC Input Connector)

NAME	COLOUR	ACTIVE
AC Present	Green	AC Present on the PSU Input.
Output Healthy	Green	DC Output within specified range 21.1V to 27.5Vdc
Current Limit	Red	Unit in overload/current limiting
Output Over-voltage trip	Red	Unit shutdown/tripping due to Output over-voltage trip – above 27.5Vdc
Output Over-temperature trip	Red	Unit shutdown/tripping due to high temperature protection trip
Fan Fail	Red	Fan stopped or running at abnormally low speed. Note fan fail not reported at temperatures less than 5°C

## 4 MECHANICAL

### 4.1 PHYSICAL

<b>Format</b>	Fits within space envelope (WxLxH) of 90 x 175 x 85mm
<b>Weight</b>	1.7Kg
<b>Finish</b>	Sur Tec 650 or RoHS compliant alternative to Alocrome 1000 clear finish.

### 4.2 CONNECTORS

<b>Input</b>	Standard IEC320 with retaining clip
<b>Output</b>	Amphenol 62GB-56T14-04SN-LC/N Pin A = 0VDC Pin B = +24VDC Pin C = +24VDC Pin D = 0VDC
<b>Signals</b>	9-Way D-sub with 2 off guide pin arrangement Pin 1 = AC Input Healthy Pin 2 = DC Output Healthy Pin 3 = Current Limit Alarm Pin 4 = Spare Pin 5 = Over-temperature Alarm Pin 6 = Fan Fail Alarm Pin 7 = +5VE Pin 8 = EGND Pin 9 = Spare

## 5 ENVIRONMENTAL

<b>Operating temperature</b>	-15°C to +50°C
<b>Starting Temperature</b>	-20°C to +50°C
<b>Storage temperature</b>	-40°C to +100°C
<b>Cooling</b>	Integral Fan cooling with active fan speed control
<b>Humidity</b>	Operational: 0% to 95%RH non-condensing, Non-operational: 0% to 95%RH non-condensing
<b>Altitude</b>	Operational: 0m – 3,000m (0 ft – 10,000 ft). Non-Operational: 0m – 10,000m (0 ft – 30,000 ft)
<b>Vibration</b>	Compliant with BS2011 Test Fc Drop and topple – EN60068-2-31 Test Ec Bump – EN60068-2-47 Test Eb Transportation – BS2011 Part 2.1 Test Fc in original packing Drop – EN60068-2-32 Test Ed in original packing
<b>Dust</b>	The PSU is designed to operate in extremely dusty environments such as a stationary wheeled or tracked vehicle in a very arid environment.
<b>Pollution</b>	EN60950 Pollution Degree 2
<b>Isolation</b>	Input to Output: 3000Vac rms test voltage Input to Earth/Chassis: 1500Vac rms test voltage Ground leakage current: 3.5mA max at 240V, 60Hz input Output and Signals to Earth/Chassis: 500Vac rms test voltage, 100Vdc working voltage

## 6 STANDARDS

<b>Safety</b>	EN60950/IEC950/UL60950
<b>EMC</b>	Input compliant with EN55022 Class B, EN61000-3-2
<b>Environmental</b>	Output compliant with EN55022 Class A, MIL-STD-461E, MIL-STD-462
<b>UL/CE mark</b>	Included in accordance with EC Low Voltage Directive and UL Safety Requirements for North America
<b>ROHS</b>	Compliant to 2002/95/EC