

# Switching Power Supply Type SPP1 20W Enclosed type

CARLO GAVAZZI



- Universal AC input full range
- Short circuit protection
- Internal input filter
- High efficiency
- High average efficiency (meet ErP)
- Low stand-by power consumption
- CE, TUV, and cURus approved

## Product Description

Enclosed Switching Power Supply meet your needs for AC DC and DC DC power requirements. SPP provide the most flexible OEM system power solutions from 5V to 24V at 20W for industrial control and automation applications. Most carry full certifications and offer wide range universal input, screw terminal connections. Especially designed where compact dimensions and performance are a must.

## Ordering Key

**SP P1 24 20 1 X**

Model \_\_\_\_\_  
 Mounting (P1 = Panel) \_\_\_\_\_  
 Output voltage \_\_\_\_\_  
 Output power \_\_\_\_\_  
 Input Type \_\_\_\_\_  
 Optional features \_\_\_\_\_

Input type: 1= single phase

## Approvals



## Output Performances

MODEL NO.	INPUT VOLTAGE	OUTPUT POWER	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	EFF. (avg.)
<b>Single Output Models</b>							
SPP1 05201	88~264 VAC	20 WATTS	+ 5 VDC	4000 mA	81%	83%	80%
SPP1 12201	88~264 VAC	20.4 WATTS	+ 12 VDC	1700 mA	84%	86%	83%
SPP1 15201	88~264 VAC	21 WATTS	+15 VDC	1400 mA	85%	87%	84%
SPP1 24201	88~264 VAC	21.6 WATTS	+24 VDC	900 mA	85%	87%	84%

## Output Data All specifications are at nominal values, full load, 25°C unless otherwise noticed

Line regulation	± 0.5%
Load regulation	±1%
Minimum load	0%
Turn on time (full resistive load)	
Vi nom, Io nom	1000ms
Vi nom, Io nom with 3500µF	1500ms
Transient recovery time	2ms
Ripple and noise	100mVpp
Output voltage accuracy	+ 1%
Temperature coefficient	± 0.03%/°C
Hold up time	
Vi= 115VAC	15ms
Vi= 230VAC	80ms
Voltage fall time (I <sub>o</sub> nom, Vi nom)	150ms
Voltage rise time	
Vi nom, Io nom (full resistive load)	150ms
Vi nom, Io nom with 3500µF CAP	500ms

Voltage trim range	
5V Model	4.5-5.5 VDC
12V Model	10.8-13.2 VDC
15V Model	13.5-16.5 VDC
24V Model	21.6-27.6 VDC
Rated continuous loading	
5V Model	4A @ 5VDC/3.6A @ 5.5VDC
12V Model	1.7A @ 12VDC/1.5A @ 13.2VDC
15V Model	1.4A @ 15VDC/1.25A @ 16.5VDC
24V Model	0.9A @ 24VDC/0.75A @ 27.6VDC
Reverse voltage	
5V Model	7.5VDC
12V Model	18VDC
15V Model	22VDC
24V Model	35VDC
Capacitor load	3500µF

## Input Data All specifications are at nominal values, full load, 25°C unless otherwise noticed

<b>Rated input voltage</b> $I_{nom}$	100 - 240VAC	<b>Power dissipation</b> ( $V_i$ : 230VAC, $I_o$ nom)	<b>5V Model</b>	4.5W
<b>Voltage range</b>			<b>12V Model</b>	4W
<b>AC IN</b>	88 - 264VAC	<b>15V Model</b>	4W	
<b>DC IN</b>	120 - 375VDC	<b>24V Model</b>	4W	
<b>Rated input current</b>		<b>Frequency range</b>	47- 63Hz	
<b><math>V_i</math>: 115/230 VAC <math>I_o</math> nom</b>	390mA / 250 mA	<b>Leakage current</b>		
<b><math>V_i</math>: 88 VAC <math>I_o</math> nom</b>	250mA	<b>Input-Output</b>	0.25mA	
<b>Inrush current</b>		<b>Input-FG</b>	3.5mA	
<b><math>V_i</math>= 115VAC</b>	20A			
<b><math>V_i</math>= 230VAC</b>	40A			

## Controls and Protections All specifications are at nominal values, full load, 25°C unless otherwise noticed

<b>Overload</b>	120 – 160%	<b>Over voltage protection</b>	<b>VDC</b>	
<b>Input fuse</b>	T2A/250VAC internal <sup>1)</sup>		<b>Min.</b>	<b>Max.</b>
<b>Output short circuit</b>	Hiccup mode	<b>5V Model</b>	5.75	6.75
		<b>12V Model</b>	13.8	16.2
		<b>15V Model</b>	17.25	20.25
		<b>24V Model</b>	28.8	32.4

<sup>1)</sup> Fuse not replaceable by user

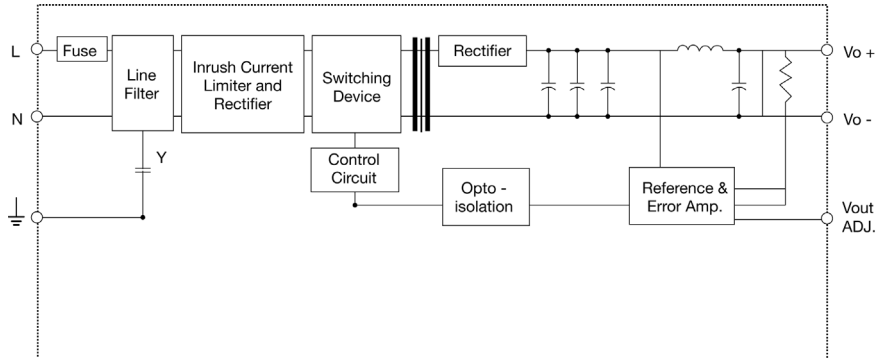
## General Data All specifications are at nominal values, full load, 25°C unless otherwise noticed

<b>Ambient temperature</b>	-40°C to +71°C	<b>MTBF</b> (Bellcore issue 6 @ 40°C, GB)	<b>5V Model</b>	729000 Hours
<b>Derating (&gt;60°C to +71°C)</b>	2.5%/°C (see curve)		<b>12V Model</b>	740000 Hours
<b>Relative humidity</b>	20 ~ 95%RH		<b>15V Model</b>	746000 Hours
<b>Storage</b>	-40°C to +85°C		<b>24V Model</b>	772000 Hours
<b>Protection degree</b>	IP20		<b>Case material</b>	Plastic: PC, UL94-V0
<b>Cooling</b>	Free air convection	<b>Altitude IEC 60068-2-13</b>	4850m	
<b>Insulation voltage</b>		<b>Stand-by power consumption</b>	0.3W	
<b>Input-Output</b>	3.000VAC/4242VDC min	<b>Dimensions LxWxD mm(inch)</b>	92(3.62)x54(2.13)x30(1.18)	
<b>Input-FG</b>	1.500VAC/2121VDC min	<b>Weight</b>	140g	
<b>Insulation resistance I/O</b>	100MΩ min (@ 500VDC)			
<b>Switching Frequency</b>	65 Khz			

## Norms and Standards

<b>Vibration resistance</b>	meet IEC 60068-2-6 (10-500Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)	<b>CE</b>	EN 61000-6-3, EN 55022
<b>Shock resistance</b>	meet IEC 60068-2-27 (15G, 11ms, 3 Axis, 6 faces, 3 times for each face)		Class B, EN 61000-3-2,
<b>UL / cUL</b>	UL60950-1, Recognized		EN 61000-3-3,
<b>TUV</b>	EN 60950 -1 CB scheme	EN 61000-6-2,	EN 55024,
		EN 61000-4-2,	EN 61000-4-3,
		EN 61000-4-4,	EN 61000-4-4,
		EN 61000-4-5,	EN 61000-4-5,
		EN 61000-4-6,	EN 61000-4-6,
		EN 61000-4-8,	EN 61000-4-8,
		EN 61000-4-11,	EN 61000-4-11,
		ENV 50204,	ENV 50204,
		EN 61204-3	EN 61204-3

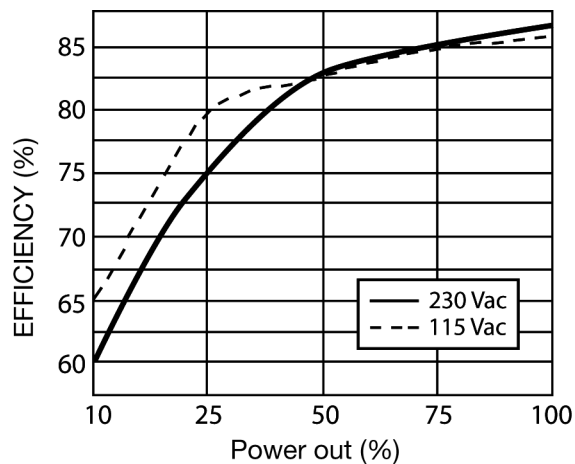
## Block Diagrams



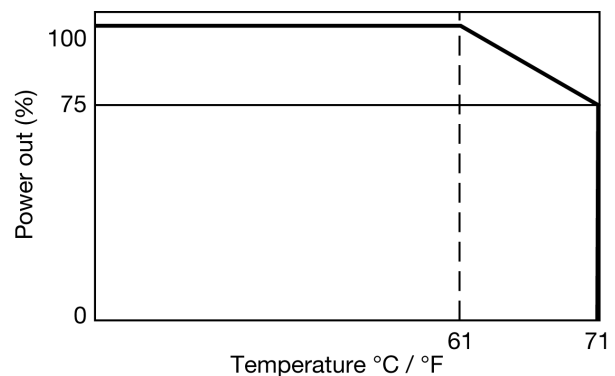
## Pin Assignment and Front Controls

Pin No.	Designation	Description
1	L	Input terminals (phase conductor, no polarity at DC input)
2	N	Input terminals (neutral conductor, no polarity at DC input)
3	⊕	Ground this terminal to minimize high-frequency emissions
4	-	Negative output terminal
5	+	Positive output terminal
	Vout ADJ	Trimmer-potentiometer for Vout adjustment
	DC ON	Operation indicator LED

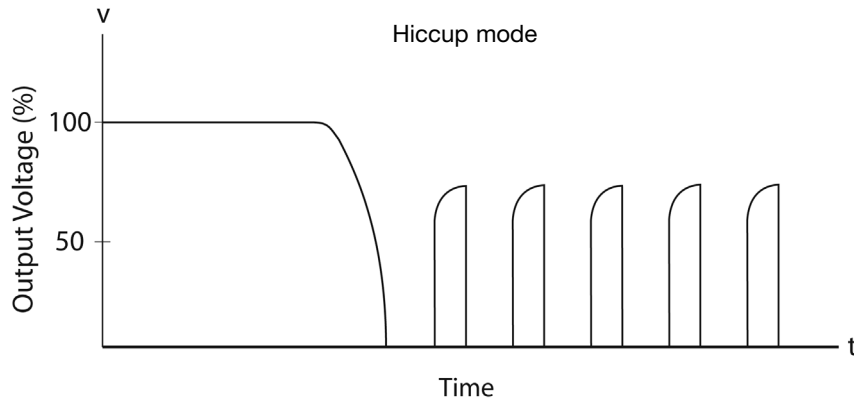
## Typ. Efficiency Curve



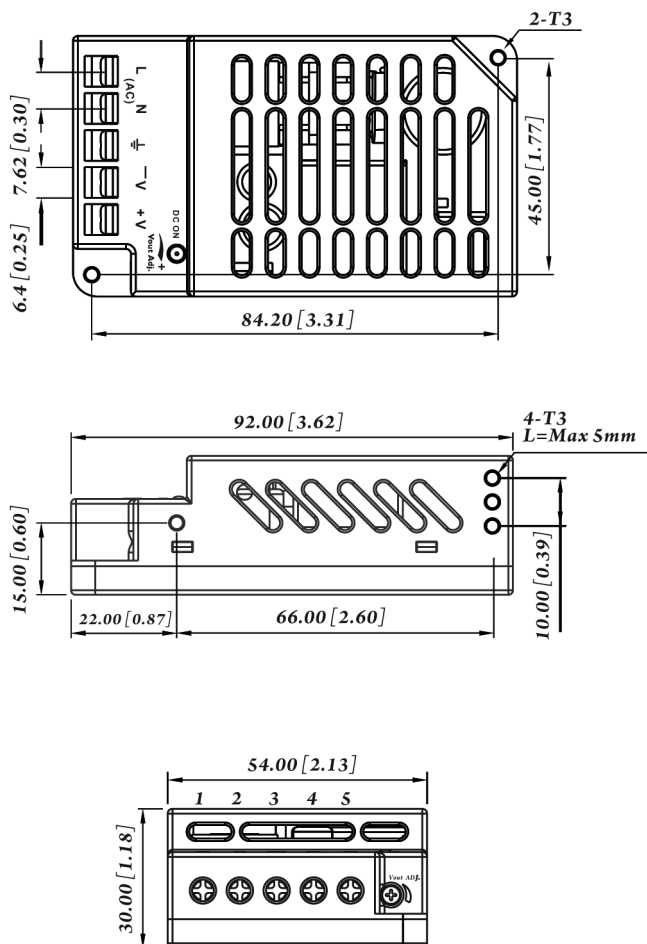
## Derating Diagram



## Typ. Current Limited Curve



## Mechanical Drawings mm (inches)



## Installation

### Ventilation and cooling

Ventilation/Cooling Normal convection

### Connector size range Spring terminal

AWG22-12 (0.2~2.5mm<sup>2</sup>) flexible/solid cable, 10mm stripping at cable connector can withstand torque at maximum 0.90 Nm (8 pound-inches)

### General tolerances mm(in.)

0.00 (0.00) ÷ 30.00 (1.18) ±0.30 (0.01)  
 30.00 (1.18) ÷ 120.00 (4.72) ±0.50 (0.02)