

Switching Power Supply

Type SPP1 35W

Enclosed type

CARLO GAVAZZI



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

Product Description

Enclosed Switching Power Supply meets your needs for AC DC and DC DC power requirements. SPP provides the most flexible OEM system power solutions from 5V to 24V at 20W for industrial control and automation applications. All the range carries full certification and offers a wide range universal of input and screw terminal connections. It has been designed for its performance and compact dimensions.

Ordering Key

SP P1 24 35 1 X

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

Input type: 1= single phase

Approvals



Output Performance

MODEL NO.	INPUT VOLTAGE	OUTPUT POWER	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)	EFF. (avg.)
Single Output Models							
SPP1 05351	88~264 VAC	30 WATTS	+ 5 VDC	6000 mA	80%	82%	82%
SPP1 12351	88~264 VAC	36 WATTS	+12 VDC	3000 mA	84%	86%	85%
SPP1 15351	88~264 VAC	36 WATTS	+15 VDC	2400 mA	85%	87%	85%
SPP1 24351	88~264 VAC	36 WATTS	+24 VDC	1500 mA	85%	87%	85%

Output Data

All specifications are at nominal values, full load, 25°C unless otherwise stated

Line regulation	± 0.5%	Voltage trim range	5V Model	4.5 - 5.5VDC
Load regulation	± 1%		12V Model	10.8 - 13.2VDC
Minimum load	0%		15V Model	13.5 - 16.5VDC
Turn on time (full resistive load)	1000ms		24V Model	21.6 - 27.6VDC
Vi nom, lo nom	1500ms	Rated continuous loading	5V Model	9A@ 5VDC/8.1A @ 5.5VDC
Vi nom, lo nom with 3500µF			12V Model	5A@ 12VDC/4.5A @ 13.2VDC
Transient recovery time	2ms		15V Model	4A @ 15VDC/3.6A @ 16.5VDC
Ripple and noise	100mVpp		24V Model	2.5A @ 24VDC/2.15A @ 27.6VDC
Output voltage accuracy	+ 1%	Reverse voltage	5V Model	7.5VDC
Temperature coefficient	± 0.03%/°C		12V Model	18VDC
Hold up time Vi= 115VAC	10ms		15V Model	22VDC
Vi= 230VAC	80ms		24V Model	35VDC
Voltage fall time (I _o nom, Vi nom)	150ms	Capacitor load		7000µF
Voltage rise time				
Vi nom, lo nom (full resistive load)	150ms			
Vi nom, lo nom with 3500µF CAP	500ms			

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

Rated input voltage I_{nom}	100 - 240VAC	Power dissipation (V_i : 230VAC, I_o nom)	5V Model 8W
Voltage range		12V Model 7W	
AC IN	88 - 264VAC	15V Model 6.5W	
DC IN	120 - 375VDC	24V Model 6.5W	
Rated input current		Frequency range	47- 63Hz
V_i: 115 / 230 VAC I_o nom	620/400 mA	Leakage current	
V_i: 88 VAC, I_o nom	800mA	Input-Output	0.25mA
Inrush current		Input-FG	3.5mA
V_i= 115VAC	20A		
V_i= 230VAC	40A		

Controls and Protection All specifications are at nominal values, full load, 25°C unless otherwise stated

Overload	110 – 170%	Over voltage protection	VDC	
Input fuse	T2A/250VAC internal ¹⁾		Min.	Max.
Output short circuit	Hiccup mode	5V Model	5.75	6.75
		12V Model	13.8	16.2
		15V Model	17.25	20.25
		24V Model	28.8	32.4

¹⁾ Fuse not replaceable by user

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

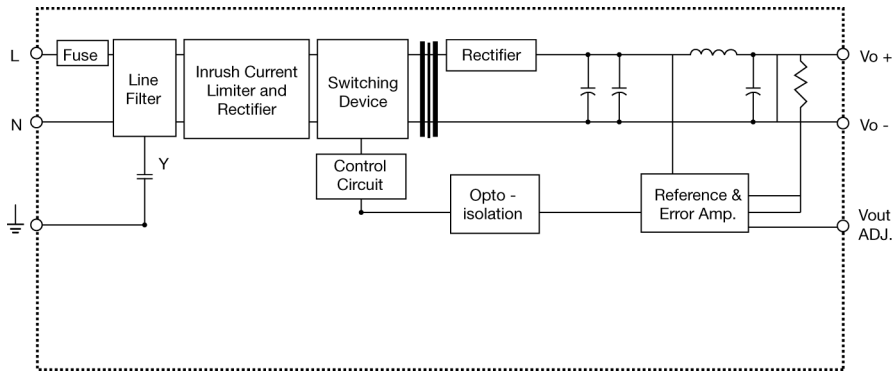
Ambient temperature	-40°C to +71°C	MTBF (Bellcore issue 6 @ 40°C, GB)	
Derating (+56°C to +71°C)	2.5%/°C (see curve)	5V Model	666000 Hours
Relative humidity	20 ~ 95%RH	12V Model	695000 Hours
Storage	-40°C to +85°C	15V Model	712000 Hours
Protection degree	IP20	24V Model	716000 Hours
Cooling	Free air convection	Case material	Metal
Insulation voltage		Altitude IEC 60068-2-13	4850m
Input-Output	3.000VAC/4242VDC min	Stand-by power consumption	0.3W
Input-FG	1.500VAC/2121VDC min	Dimensions LxWxD mm(inch)	78(3.07)x51(2)x28(1.1)
Insulation resistance I/O	100MΩ min (@ 500VDC)	Weight	180g
Switching Frequency	65Khz		

Norms and Standards

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



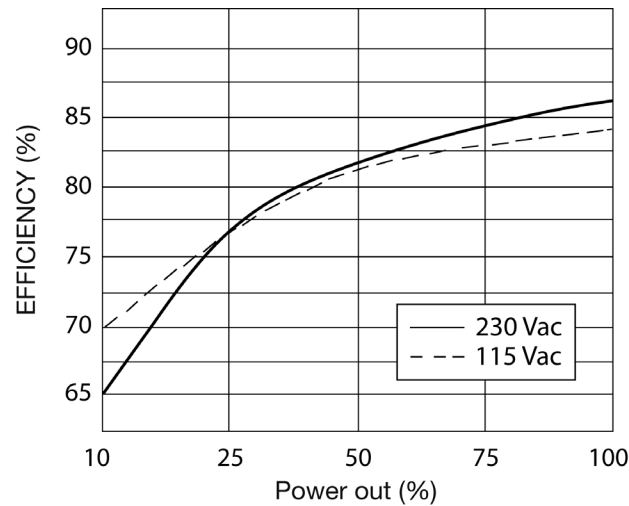
Block Diagrams



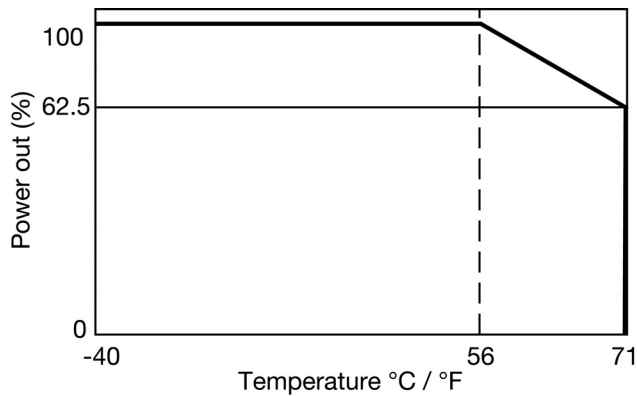
Pin Assignment and Front Controls

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

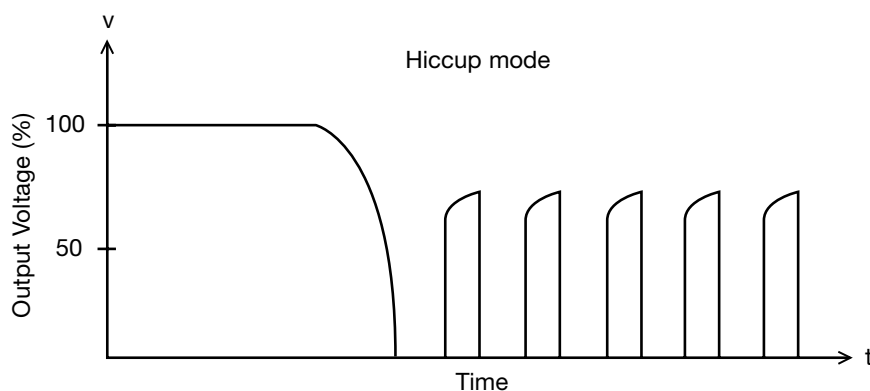
Typ. Efficiency Curve



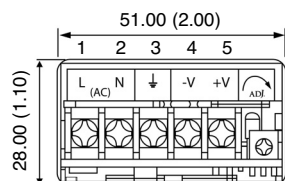
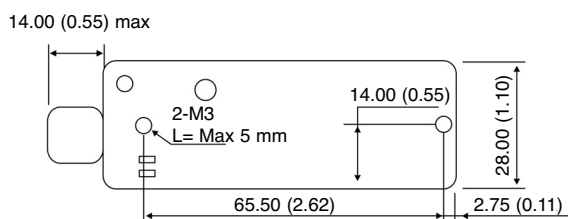
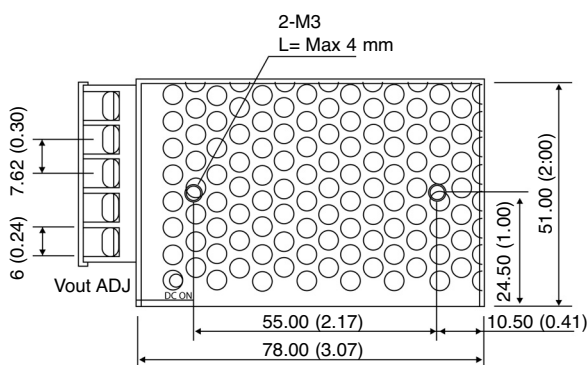
Derating Diagram



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 ²) flexible/solid cable, connector can withstand torque at maximum 0.90 Nm (8 lb/in)
Max. torque for terminal Input terminals Output terminals	0.56Nm (5.0lb-in) 0.56Nm (5.0lb-in)
General tolerances mm(in.) 0.00 (0.00) ÷ 30.00 (1.18) 30.00 (1.18) ÷ 120.00 (4.72)	±0.30 (0.01) ±0.50 (0.02)