Switching Power Supply
Type SPD 100W Bi-Phase
DIN rail mounting

CARLO GAVAZZI

- Installation on DIN Rail 7.5 or 15mm
- Short circuit protection
- Input single phase 340 to 575VAC
- Passive PFC
- Power ready output on 24VDC
- LED indicator for DC power ON
- LED indicator for DC low
- Standard parallel function
- Very compact dimensions
- UL, cUL listed and TUV/CE approved
- Class I div2 certification (in progress)

Product Description

This particular SPD is the most compact 100W power supply on the market. Relay output for "power ready" parallel function and PFC are included. Performances are unique with high efficiencies and the possibility of being used up to 70°C with a little derating. Furthermore it can be powered with 2 phases of a 3 phase grid system due to its high voltage input.

Ordering Key

SP D 24 100 2

- **Model**
- **Mounting (D = Din rail)**
- **Output voltage**
- **Output power**
- **Input type**

Input type: 2= single phase high voltage (bi-phase)

Approvals

Output Performances

Model	Rated output Voltage (VDC)	Output Power (W)	Output Current (A)	Voltage Trim Range 0.8 $I_{o\ nom}$		DC ON LED (VDC) Threshold at startup		DC LO LED (VDC) Threshold after startup		Typical Efficiency
				Min. VDC	Max. VDC	Min.	Max.	Min.	Max.	
SPD12100	12	100.8	8.4	11.4	14.5	10	11.2	10	11.2	86%
SPD24100	24	100.8	4.2	22.5	28.5	17.6	19.4	17.6	19.4	87%
SPD48100	48	100.8	2.1	47.0	56.0	37.0	43.0	37.0	43.0	89%

Output Data

Output voltage accuracy	-0 +1% max (factory adjusted)
Line regulation	± 1%
Load regulation	
Non parallel model	± 1%
Parallel model	± 5%
Temp. coefficient	± 0.03% / °C
Ripple and noise $V_{i\ nom}$, $I_{o\ nom}$, **BW=20MHz**	50mV
Rated continuous Loading	8.4A @ 12VDC / 6.9A @14.5VDC 4.2A @ 24VDC / 3.5A @ 28.5VDC 2.1A @ 48VDC / 1.8A @ 56VDC
Fall Time	150ms
Transient recovery time	
$V_{i\ nom}$, I_o= 0.5 x I_{nom}	2ms
Turn On Time	
$V_{i\ nom}$, $I_{o\ nom}$	1.0s
$V_{i\ nom}$, $I_{o\ nom}$ with Capacitor load	1.5s
Rise Time	
$V_{i\ nom}$, $I_{o\ nom}$	150ms
$V_{i\ nom}$, $I_{o\ nom}$ with Capacitor load	500ms
Capacitor Load	
12V, 24V versions	7000µF
48V version	3500µF
Reverse Voltage Immunity	
12V	18V
24V	35V
48V	63V
Hold up Time $V_{i\ nom}$ $I_{o\ max}$	20ms
Minimum load $V_{i\ nom}$	0%
Parallel Operation	2 units max.
0.1 $I_{o\ min}$**~0.9** $I_{o\ max}$	

Input Data

Rated input voltage	400/500VAC
Voltage range	
AC in	340 - 575VAC
DC in	480 - 820VDC
Rated input current	0.48A / 0.75A
Power dissipation	
12V	15.0W
24V	13.0W
48V	10.5W

Frequency range	47 - 63Hz
Internal Voltage Surge Protection (acc. to IEC61000-4-5)	Varistor
Leakage Current	
Input / Output	0.25mA
Input / FG	3.5mA
Inrush current	10A
P.F.C.	0.55

Controls and Protections

Input Fuse	2A/600VAC internal[1)]
Output Short Circuit	current limit
Rated Overload Protection	115 - 135%
Over voltage protection (auto recovery)	
12V model	14.5V to 17.4V
24V model	30.0V to 33.0V
48V model	60.0V to 66.0V

Input Voltage Surge Protection	Varistor
Power ready (only SPD241002)	
Threshold at start up (contact closed)	Min. 17.6VDC - Max.19.4VDC
Contact rating at 60VDC	0.3A
Insulation	500VDC

[1)] Fuse not replaceable by user

General Data (@ nominal line, full load, 25°C)

Ambient temperature	-25°C to 71°C
Derating (>61°C to +71°C)	2.5% / °C
Ambient humidity	20 to 95%RH
Storage	-25°C to +85°C
Pollution degree	2
Protection degree	IP20
Cooling	Free air convection
Switching frequency	45kHz

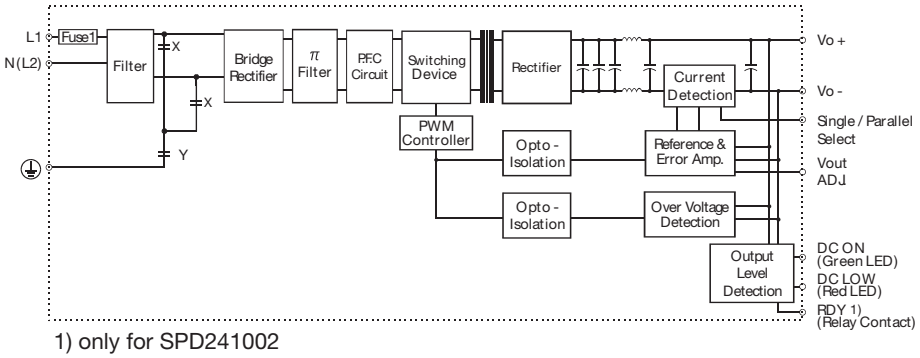
MTBF (Bellcore Issue 6@40°C), GB	
12V model	622.000h
24V model	661.000h
48V model	672.000h
Altitude during operation	3.000m
Case material	Plastic
Dimensions L x W x D	90 x 54 x 114mm
Weight	500g

Approvals and EMC

Insulation voltage	
Input / Output	3.000VAC / 4242VDC
Input / FG	1500VAC / 2121VDC
Insulation resistance	100MΩ min
Shock resistance	acc. to IEC 60068-2-27 (15G, 11ms, 3 Axis, 6 Faces, 3 times for each Face)
Vibration resistance	acc. to IEC 60068-2-6 (Mounting by rail: 10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)
UL / cUL	UL 508 Listed UL 60950-1, Recognized ISA 12.12.01 (Class I, Division 2, Groups A, B, C and D in progress)
TUV	EN 60950-1, CB scheme EN 61558-1, EN 61558-2-17 (acc.to EN 60204)

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 Level 4, EN 61000-4-3 Level 3 EN 61000-4-4 Level 4, EN 61000-4-5 L-N Level 3, L / N-FG Level 4 EN 61000-4-6 Level 3, EN 61000-4-8 Level 4, EN 61000-4-11 ENV 50204 Level 2, EN 61204-3

Block Diagrams



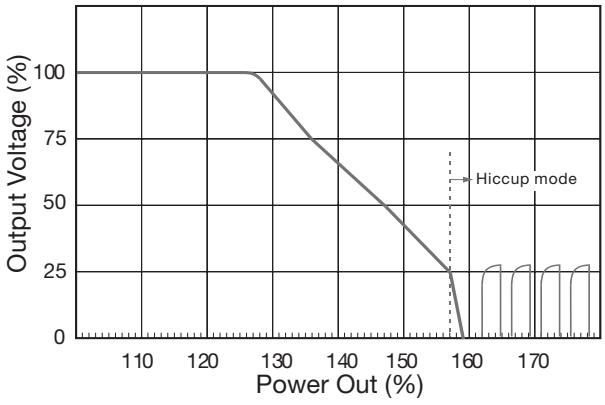
1) only for SPD241002

Pin Assignment and Front Controls

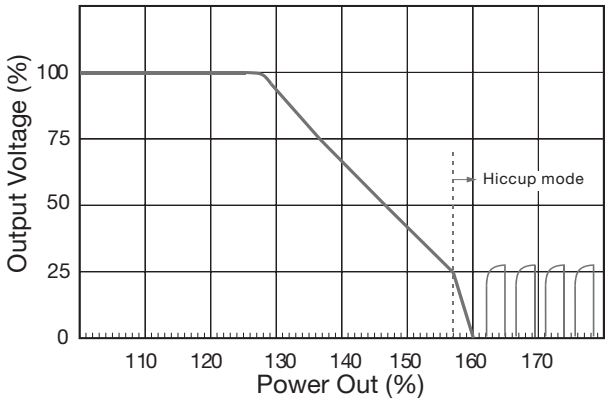
Pin No.	Designation	Description
1	**RDY**	NO relay contact for DC OK (only SPD241002)
2	**RDY**	NO relay contact for DC OK (only SPD241002)
3	**V+**	Positive output terminal
4	**V+**	Positive output terminal
5	**V-**	Negative output terminal
6	**V-**	Negative output terminal
7	**GND**	Ground terminal to minimise High frequency emissions
8	**N or L2**	Neutral or phase 2 (no polarity with DC input)
9	**L1**	Phase 1 (no polarity with DC input)
L1	**DC ON**	DC output ready LED
L2	**DC LO**	DC low indicator LED
POT1	**Vout ADJ.**	Trimmer for fine output voltage adjustment
SW1	**S/P**	Single / Parallel select switch

Typ. Current Limited Curve

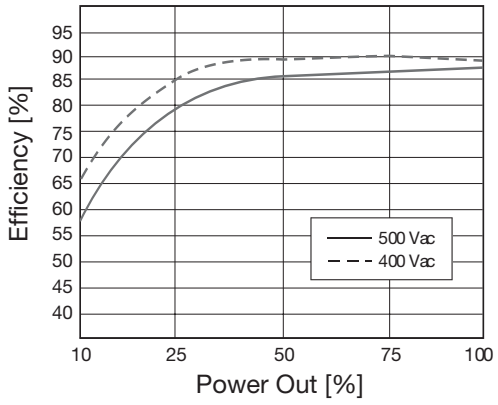
SPD241002 / 400VAC



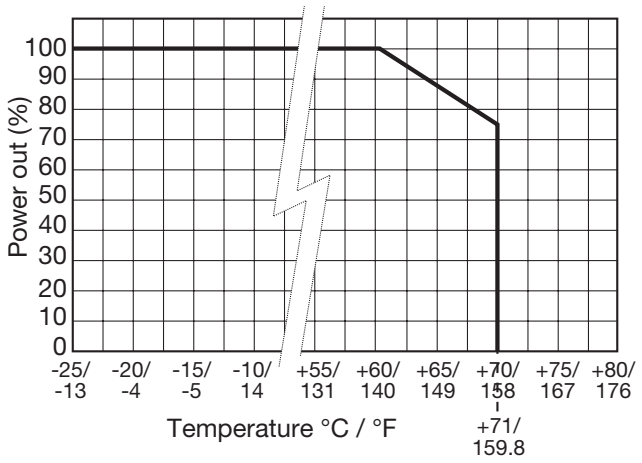
SPD241002 / 500VAC



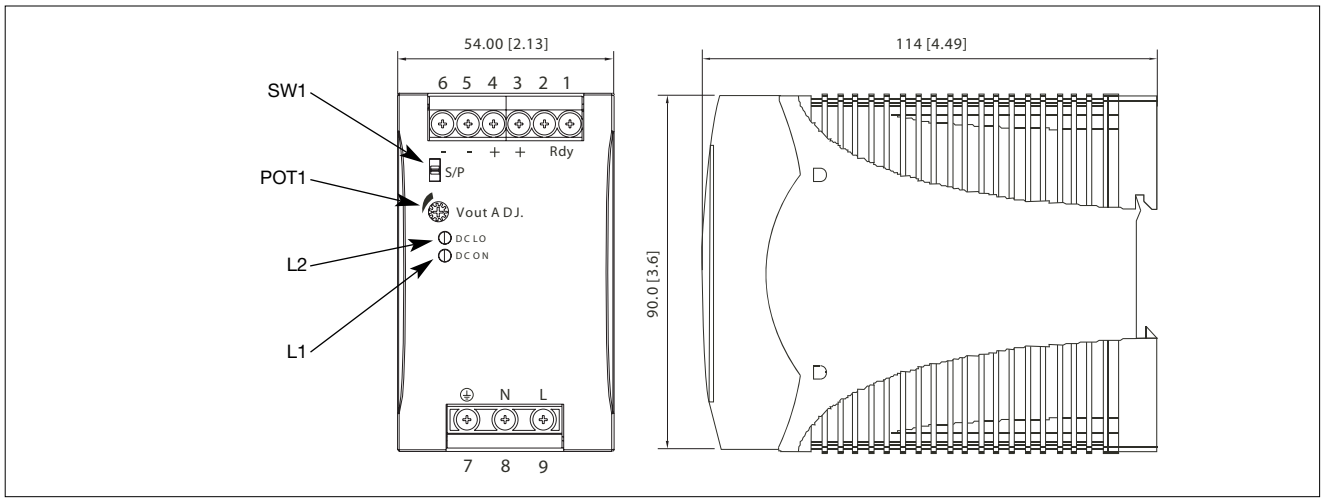
Typ. Efficiency Curve



Derating Diagram



Mechanical Drawings mm (inches)



Installation

Ventilation and cooling	Normal convection All sides 25mm free space for cooling is recommended
Screw terminals	10-24AWG flexible or solid cable 8mm stripping recommend
Max. torque for screws terminals	
Input terminals	1.008Nm (9.0lb-in)
Output terminals	0.616Nm (5.5lb-in)
Plug-in connectors	10-24AWG flexible or solid cable 7mm stripping recommend
Max. torque for plug-in terminals	
Input terminals	0.784Nm (7.0lb-in)
Output terminals	0.784Nm (7.0lb-in)
Recommended circuit breaker	3A / 5A / 6A B, D characteristics