

# Switching Power Supply Type SPD 960W 3 phases DIN rail mounting



- Universal AC 3 phases input full range
- Can also be used as bi-phase 960VAC
- Installation on DIN rail 7.5 or 15mm
- PFC as standard
- High efficiency up to 93%
- Power ready output
- Parallel connection feature (except "L" version)
- Compact dimensions
- UL, cUL listed and TUV/CE

## Product Description

The Switching power supplies SPD XX9603 series are suitable for those applications where high DC power is required. Besides the PFC as standard, it also features the parallel connection with active current sharing on the high end versions.

## Ordering Key

**SP D 24 960 3 L**

Model \_\_\_\_\_  
 Mounting (D= Din rail) \_\_\_\_\_  
 Output voltage \_\_\_\_\_  
 Output power \_\_\_\_\_  
 Input Type \_\_\_\_\_  
 Option \_\_\_\_\_

Input type: 3 = three phase  
 (or single phase 400/500VAC<sup>3</sup>)  
 Option: Nil = standard version  
 L = without active current sharing feature

## Approvals



## Output performances

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)
<b>Single Output Models</b>						
SPD24	3ø 340~575 VAC	960 WATTS	+ 24 VDC	40 A	90%	92%
SPD24...L	3ø 340~575 VAC	960 WATTS	+ 24 VDC	40 A	90%	92%
SPD48	3ø 340~575 VAC	960 WATTS	+ 48 VDC	20 A	91%	93%

## Output data

Line regulation	± 0.5%	Hold up time $V_i$ nom, $I_o$ nom	15ms
Load regulation		Voltage fall time ( $I_o$ nom)	150ms max
Single mode	± 1%	Rated continuous loading	
Parallel mode	± 5%	24V Model	40A @ 24VDC/33.8A @ 28.5VDC
Minimum load	0	48V Model	20A @ 48VDC/17A @ 56VDC
Turn on time (full resistive load)		Reverse voltage	
$V_i$ nom, $I_o$ nom	1000ms	24V Model	35VDC
$V_i$ nom, $I_o$ nom with 7000µF CAP	1500ms	48V Model	63VDC
Transient recovery time	2ms	Capacitor load	7000µF
Ripple and noise	80mVpp	Voltage rise time	
Output voltage accuracy	+ 1%	$V_i$ nom $I_o$ nom	150ms
Temperature coefficient	± 0.03%/°C	$V_i$ nom, $I_o$ nom with 7000µF CAP	500ms

## Input data

<b>Rated input voltage</b>	400 - 500VAC	<b>Power dissipation</b>	
<b>Voltage range</b>		<b>Vi: 400 VAC, Io nom 24V Model</b>	98W
<b>AC</b>	340 - 575VAC	<b>48V Model</b>	55W
<b>DC</b>	480 - 820VDC	<b>Frequency range</b>	47- 63Hz
<b>Rated input current</b> (Vi: 340VAC, Io nom) <b>Typ.</b>	2.4A	<b>Leakage current</b>	
<b>Inrush current</b>		<b>Input-Output</b>	0.25mA
<b>Vi nom, Io nom 24V/48V models</b>	30 - 35A	<b>Input-FG</b>	3.5mA
<b>Cold start 24L model</b>	50 - 60A		

## Controls and Protections

<b>Overload</b>	120-140%	<b>Contact rating at 60vdc</b>	0.3A
<b>Input fuse</b>	T5A/500VAC internal/phase	<b>Over voltage protection</b>	<b>VDC</b>
<b>Output short circuit</b>	Hiccup mode	<b>24V Model</b>	<b>Min.</b> 30
<b>Power ready output</b> (only 24V model) <b>On threshold</b>	≥17.6 -19.4VDC	<b>48V Model</b>	<b>Max.</b> 33
<b>Electrical isolation</b>	500VDC	<b>Internal surge voltage protection</b> (IEC 61000-4-5)	Varistor

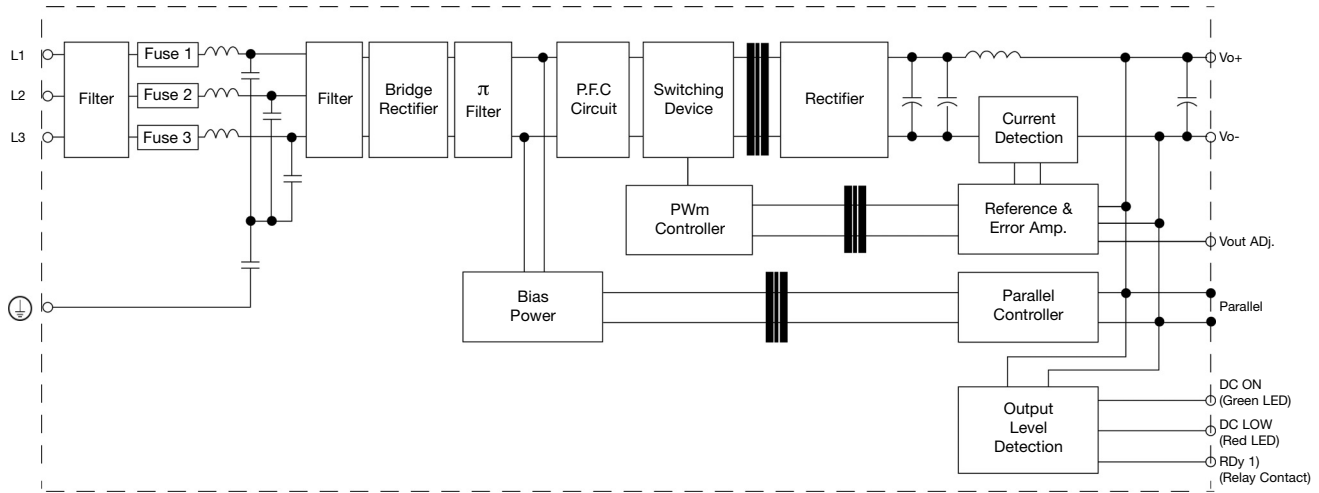
## General data (@ nominal line, full load, 25°C )

<b>Ambient temperature</b>	-40°C to 71°C	<b>MTBF</b> (Bellcore issue 6 @ 40°C, GB)	
<b>Derating (&gt;61°C to +71°C)</b>	3.5%/°C	<b>24V Model</b>	352000 Hours
<b>Ambient humidity</b>	20 ~ 90%RH	<b>24L Model</b>	381000 Hours
<b>Storage</b>	-40°C to +85°C	<b>48V Model</b>	390000
<b>Protection degree</b>	IP20	<b>Case material</b>	Metal
<b>Cooling</b>	Free air convection	<b>Dimensions LxWxD mm(inch)</b>	1262(4.97)x275.8(10.86)x118.8(4.68)
<b>Pollution degree</b>	2	<b>Weight</b>	3400g


## Norms and Standards

<b>Vibration resistance</b>	meet IEC 60068-2-6 (Mounting by rail: 10-500Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)	<b>CCC</b>	GB4943, GB9254, GB17625.1
<b>Shock resistance</b>	meet IEC 60068-2-27 (15G, 11ms, 3 Axis, 6 faces, 3 times for each face)	<b>CE</b>	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
<b>UL / cUL</b>	UL508 listed, UL60950-1, Recognized, ISA 12.12.01 (Class 1, Division 2, Groups A, B, C and D)		
<b>TUV</b>	EN 60950-1, CB scheme EN 61558-1, EN 61558-2-17 (meet EN 60204)		

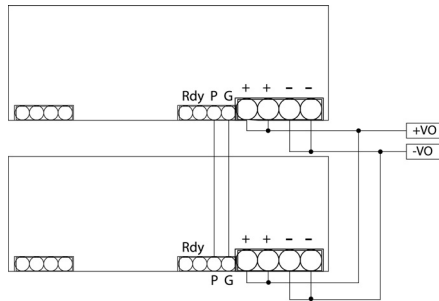
## Block diagrams



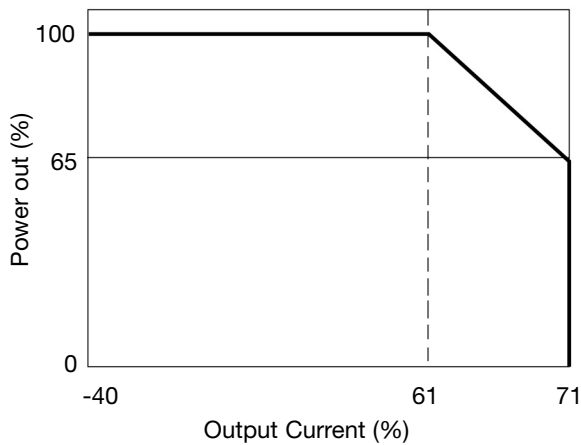
## Pin Assignment and Front Controls

Pin No.	Designation	Description
1, 2	V-	Negative output terminal
3, 4	V+	Positive output terminal
5	G	Parallel GND PIN for current share
6	P	Parallel PIN for current share
7	RDY	A normal open relay contact for DC ON level control
8		(Never connect except 24V model)
9	L3	Input terminals
10	L2	Input terminals
11	L1	Input terminal
12		Ground this terminal to minimize high-frequency emission
	DC ON	Operation indicator LED
	DC LO	DC LOW voltage indicator LED
	Vout Adj	Trimmer-potentiometer for Vout adjustment

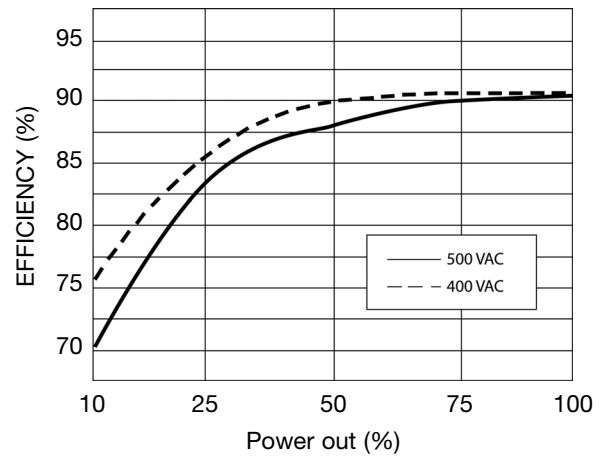
## Parallel Connection



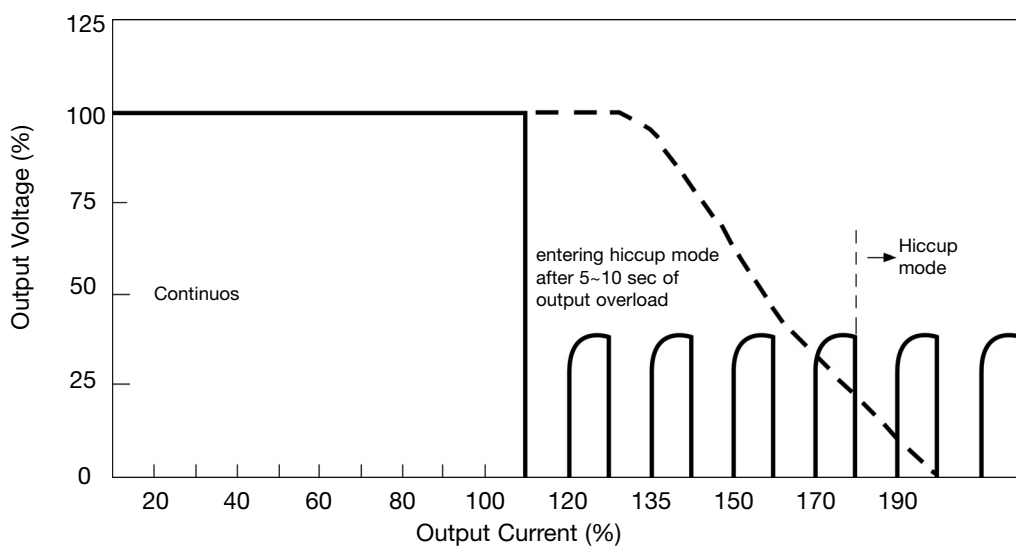
## Derating Diagram



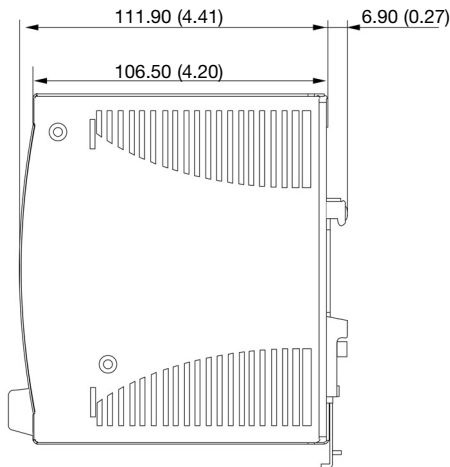
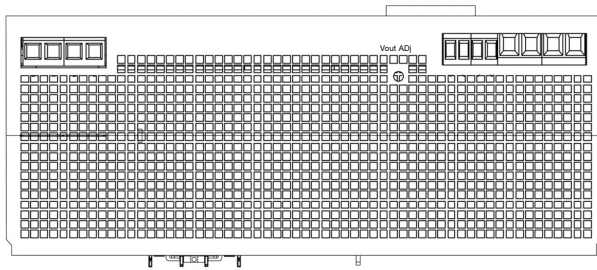
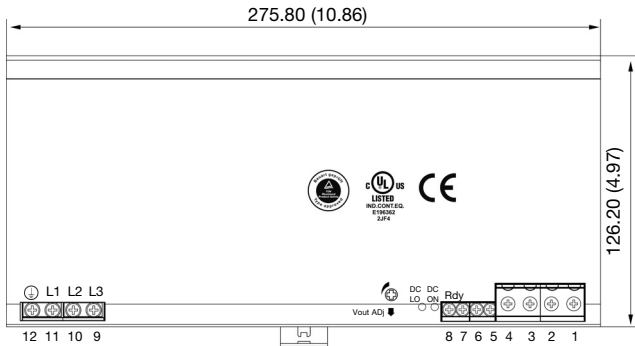
## Typ. Efficiency Curve



## Typ. Current Limited Curve



## Mechanical Drawings mm/inches



## Installation

### Ventilation and cooling

Normal convection  
All sides 25mm free space  
for cooling is recommended

### Conductors sections

From Pin1 to Pin4

10-24AWG (0.2-4mm<sup>2</sup>) flexible  
or solid cable 8mm stripping  
recommend

From Pin5 to Pin8

6-20AWG (0.5-10mm<sup>2</sup>) flexible  
or solid cable 8mm stripping  
recommend

From Pin9 to Pin12

10-24AWG (0.2-4mm<sup>2</sup>) flexible  
or solid cable 8mm stripping  
recommend

### Max. torque for screws terminals

From Pin1 to Pin4

1.008Nm (9.0lb-in)

From Pin5 to Pin8

1.763Nm (15.6lb-in)

From Pin9 to Pin12

0.616Nm (5.5lb-in)