

# Switching Power Supply Type SPD 5W DIN rail mounting

CARLO GAVAZZI



- Universal AC input full range
- Installation on DIN rail 7.5 or 15mm
- Short circuit protection
- Overload protection
- High efficiency
- LED indicator for DC power ON
- LED indication for DC low
- Internal input filter
- CE, TUV approved and cULus Listed

## Product Description

The Switching power supplies SPD series are specially designed to be used in all automation application where the installation is on a DIN rail and compact dimensions and performance are a must.

## Ordering Key

**SP D 12 05 1 B**

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

Input type: 1= single phase

## Approvals



## Optional Features

| Description       | Code |
|-------------------|------|
| Spring connectors | B    |

## Output Performances

| MODEL NO.            | INPUT VOLTAGE | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | EFF. (avg.) |
|----------------------|---------------|----------------|----------------|----------------|-------------|-------------|-------------|
| Single Output Models |               |                |                |                |             |             |             |
| SPD05                | 90~264 VAC    | 5 WATTS        | + 5 VDC        | 1000 mA        | 67%         | 83%         | 69%         |
| SPD12                | 90~264 VAC    | 5 WATTS        | +12 VDC        | 420 mA         | 70%         | 86%         | 72%         |
| SPD24                | 90~264 VAC    | 5 WATTS        | +15 VDC        | 340 mA         | 70%         | 87%         | 72%         |
| SPD48                | 90~264 VAC    | 5 WATTS        | +24 VDC        | 210 mA         | 70%         | 87%         | 72%         |

## Output Data

|                                        |            |                                          |           |                                |
|----------------------------------------|------------|------------------------------------------|-----------|--------------------------------|
| Line regulation                        | ± 1%       | Rated continuous loading                 | 5V Model  | 1.0A @ 5VDC/0.85A @ 5.75VDC    |
| Load regulation                        | ± 2%       |                                          | 12V Model | 0.42A @ 12VDC/0.36A @ 13.8VDC  |
| Minimum load                           | 0          |                                          | 15V Model | 0.34A @ 15VDC/0.28A @ 17.25VDC |
| Turn on time (full resistive load)     | 1000ms max |                                          | 24V Model | 0.21A @ 24VDC/0.17A @ 28.8VDC  |
| Transient recovery time                | 2ms        | Reverse voltage                          | 5V Model  | VDC 7.5                        |
| Ripple and noise                       | 50mVpp     |                                          | 12V Model | VDC 18                         |
| Output voltage accuracy                | ± 1%       |                                          | 15V Model | VDC 22                         |
| Temperature coefficient                | ± 0.03%/°C |                                          | 24V Model | VDC 35                         |
| Hold up time Vi= 115VAC                | 30ms       | Capacitor load                           |           | 7000µF                         |
| Vi= 230VAC                             | 130ms      | Voltage rise time at full resistive load |           | 150ms max                      |
| Voltage fall time (I <sub>0nom</sub> ) | 150ms max  |                                          |           |                                |

## Input Data

|                                                     |                                                 |                                                   |                                                                                                 |
|-----------------------------------------------------|-------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Rated input voltage</b>                          | 100 - 240VAC                                    | <b>Power dissipation</b><br>(Vi : 230VAC, Io nom) | <b>5V Model</b> 2.2W<br><b>12V Model</b> 1.9W<br><b>15V Model</b> 2.1W<br><b>24V Model</b> 1.8W |
| <b>Voltage range</b>                                | <b>AC</b> 90 - 265VAC<br><b>DC</b> 120 - 370VDC | <b>Frequency range</b>                            | 47 - 63Hz                                                                                       |
| <b>Rated input current</b><br>(Vi : 115VAC, Io nom) | <b>Typ.</b> 115mA<br><b>Max.</b> 200mA          | <b>Leakage current</b>                            | <b>Input-Output</b> 0.25mA<br><b>Input-FG</b> 3.5mA                                             |
| <b>Inrush current</b>                               | <b>Vi= 115VAC</b> 10A<br><b>Vi= 230VAC</b> 18A  |                                                   |                                                                                                 |

## Controls and Protections

|                             |                                   |                                                             |            |
|-----------------------------|-----------------------------------|-------------------------------------------------------------|------------|
| <b>Overload</b>             | 110 - 135%                        | <b>Over voltage protection</b>                              | 125 - 145% |
| <b>Input fuse</b>           | T2A/250VAC internal <sup>1)</sup> | <b>Internal surge voltage protection</b><br>(IEC 61000-4-5) | Varistor   |
| <b>Output short circuit</b> | Hiccup mode                       |                                                             |            |

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

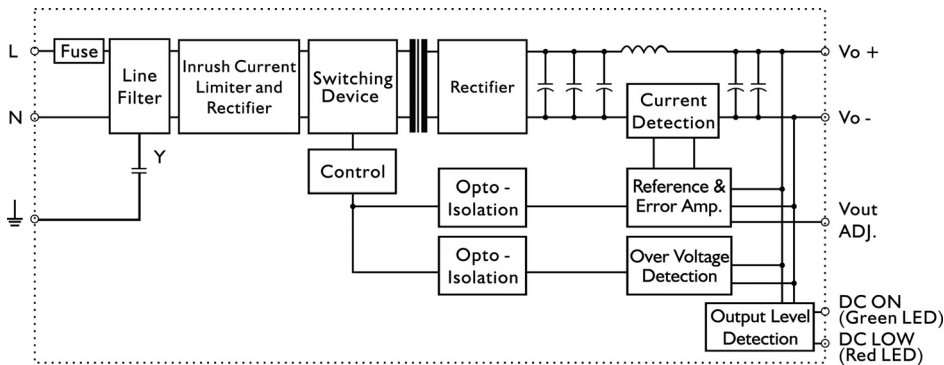
## General Data (@ nominal line, full load, 25°C )

|                                     |                                                                                  |                                           |                                                                                                                                 |
|-------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Ambient temperature</b>          | -20°C to 71°C                                                                    | <b>MTBF</b> (Bellcore issue 6 @ 40°C, GB) | <b>5V Model</b> 802000 Hours<br><b>12V Model</b> 805000 Hours<br><b>15V Model</b> 808000 Hours<br><b>24V Model</b> 812000 Hours |
| <b>Derating (&gt;61°C to +71°C)</b> | 2.5%/°C                                                                          | <b>Case material</b>                      | Plastic: PC, UL94-V0                                                                                                            |
| <b>Ambient humidity</b>             | 20 ~ 95%RH                                                                       | <b>Pollution degree</b>                   | 2                                                                                                                               |
| <b>Storage</b>                      | -25°C to +85°C                                                                   | <b>Altitude</b>                           | 4850m                                                                                                                           |
| <b>Protection degree</b>            | IP20                                                                             | <b>Dimensions LxWxD mm(inch)</b>          | 90(3.60)x22.5(0.89)x114(4.49)                                                                                                   |
| <b>Cooling</b>                      | Free air convection                                                              | <b>Weight</b>                             | 120g                                                                                                                            |
| <b>Insulation voltage</b>           | <b>Input-Output</b> 3.000VAC/4242VDC min<br><b>Input-FG</b> 1.500VAC/2121VDC min |                                           |                                                                                                                                 |
| <b>Insulation resistance I/O</b>    | 100MΩ min (@ 500VDC)                                                             |                                           |                                                                                                                                 |

## Norms and Standards

|                             |                                                                                                                                                              |           |                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vibration resistance</b> | meet IEC 60068-2-6<br>(Mounting by rail: 10-500Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis)                                                        | <b>CE</b> | EN 61000-6-3, EN 55022<br>Class B, EN 61000-3-2,<br>EN 61000-3-3,<br>EN 61000-6-2,<br>EN 55024,<br>EN 61000-4-2 Level 4,<br>EN 61000-4-3 Level 3,<br>EN 61000-4-4 Level 4,<br>EN 61000-4-5 L-Level 3,<br>L/N-FG Level 4,<br>EN 61000-4-6 Level 3,<br>EN 61000-4-8 Level 4,<br>EN 61000-4-11,<br>ENV 50204 Level 2,<br>EN 61204-3 |
| <b>Shock resistance</b>     | meet IEC 60068-2-27<br>(15G, 11ms, 3 Axis, 6 faces, 3 times for each face)                                                                                   |           |                                                                                                                                                                                                                                                                                                                                  |
| <b>UL / cUL</b>             | UL508 listed, UL60950-1,<br>UL1310 Class 2 Power<br>(only 5V, 12V w/o Class 2)<br>Recognized, ISA 12.12.01<br>(Class 1, Division 2,<br>Groups A, B, C and D) |           |                                                                                                                                                                                                                                                                                                                                  |
| <b>TUV</b>                  | EN 60950-1, CB scheme                                                                                                                                        |           |                                                                                                                                                                                                                                                                                                                                  |
| <b>CCC</b>                  | GB4943, GB9254, GB17625.1                                                                                                                                    |           |                                                                                                                                                                                                                                                                                                                                  |

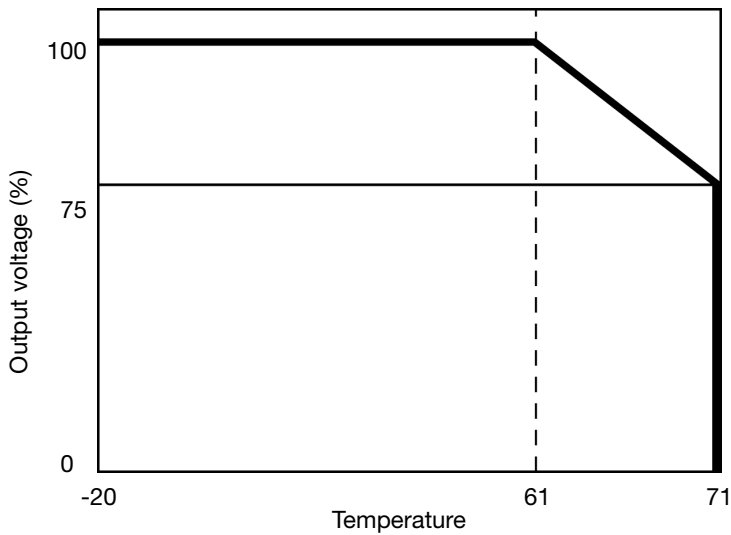
Block Diagrams



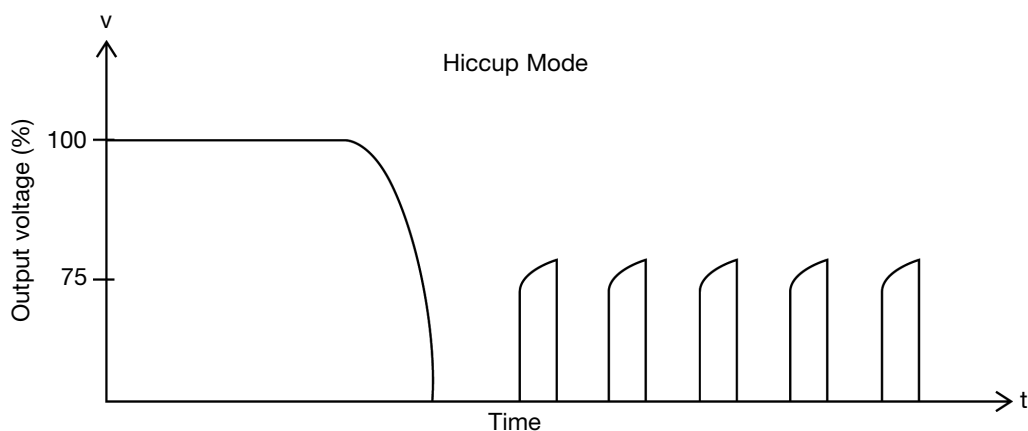
Pin Assignment and Front Controls

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

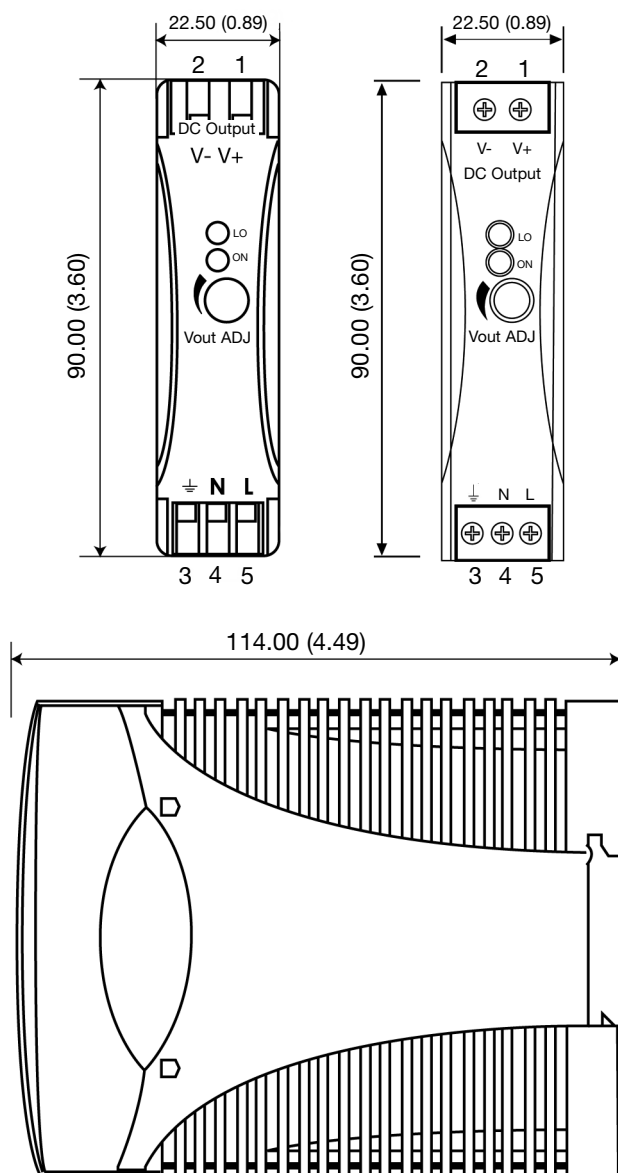
Derating Diagram



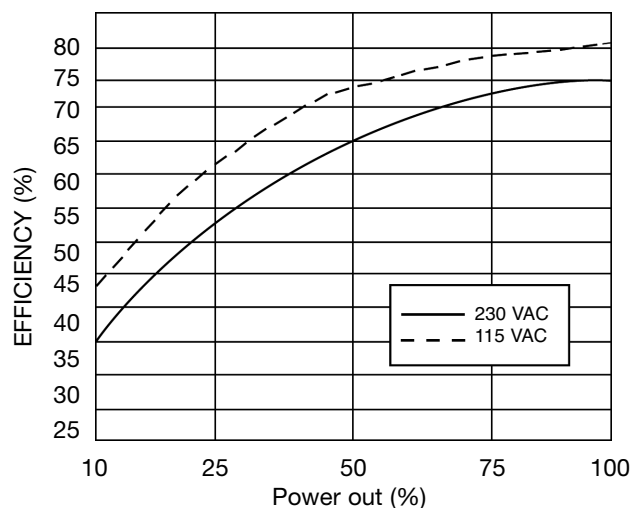
## Typ. Current Limited Curve



## Mechanical Drawings mm (inches)



## Typ. Efficiency Curve



## Installation

|                                   |                                                                                                                                                                                                |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ventilation and cooling</b>    | Normal convection<br>All sides 25mm free space for cooling is recommended                                                                                                                      |
| <b>Connector size range</b>       | AWG24-14 (0.2~2mm <sup>2</sup> ) flexible/solid cable, 10mm stripping at cable and recommends use copper conductors only, 60/75°C                                                              |
| <b>Spring terminal</b>            |                                                                                                                                                                                                |
| <b>Screw terminal</b>             | AWG26-12 (0.2~2.5mm <sup>2</sup> ) flexible/solid cable, connector can withstand torque at max 0,56Nm (5 lbs-in). 4~5 mm stripping at cable and recommends use copper conductors only, 60/75°C |
| <b>Max. torque for terminal</b>   |                                                                                                                                                                                                |
| Input terminals                   | 0.56Nm (5.0lb-in)                                                                                                                                                                              |
| Output terminals                  | 0.56Nm (5.0lb-in)                                                                                                                                                                              |
| <b>General tolerances mm(in.)</b> |                                                                                                                                                                                                |
| 0.00 (0.00) ÷ 30.00 (1.18)        | ±0.30 (0.01)                                                                                                                                                                                   |
| 30.00 (1.18) ÷ 120.00 (4.72)      | ±0.50 (0.02)                                                                                                                                                                                   |