

# SPDM



## Single Phase Power Supply



### Benefits

- **Power in compact dimensions.** The SPDM provides up to +30% space saving when compared to SPD.
- **Reliable and cost saving.** The SPDM provides high reliability power at an attractive price level.
- **Low power loss, high efficiency.** The compact design results in low energy losses and high efficiency.
- **Intuitive indication.** A clear LED indicates the status of the power supply.
- **Universal AC, DC input range.** SPDM series can be powered with AC Voltage (90 VAC to 264 VAC) or with DC Voltage (127 VDC to 370 VDC).
- **Reliable critical protection.** The operation safety is guaranteed by the various output protections: Over Voltage (OVP), Over Load (OLP), Short Circuit (zz) and Over Temperature (OTP).
- **High efficiency and wide operating ambient temperature.** These power supplies have an efficiency up to 89%.
- **Ease of installation.** The SPDM can be installed in 5 different orientations, enabling the unit to fit easily into installations with limited space.

### Description

The SPDM is designed to be used in all automation applications, where it can be easily installed on the Din rail and save installation time by up to 50% with the option of the spring terminal. The SPDM is a premium quality product at an attractive price level. Reliability is guaranteed through the multiple integrated protections.

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

### Applications

This product is extremely suitable for all applications which require single-phase power supply with universal voltage input and high efficiency.

### Main functions

- Compact dimension of up to 45 mm width
- High efficiency up to 89%
- Universal input voltage range: 90 VAC to 264 VAC; 127 VDC to 370 VDC
- 120 W, 240 W

## References

### Order code

 SPDM   1





Enter the code entering the corresponding option instead of .

Code	Option	Description	Notes
S	-	Switching	Device typology
P	-	Power	
D	-	DIN rail	
M	-	Medium	Size
<input type="checkbox"/>	12	12 VDC	Rated output voltage
	24	24 VDC	
	48	48 VDC	
<input type="checkbox"/>	120	120 W	Rated output power
	240	240 W	
1	-	Single phase input	Input type

### Selection guide

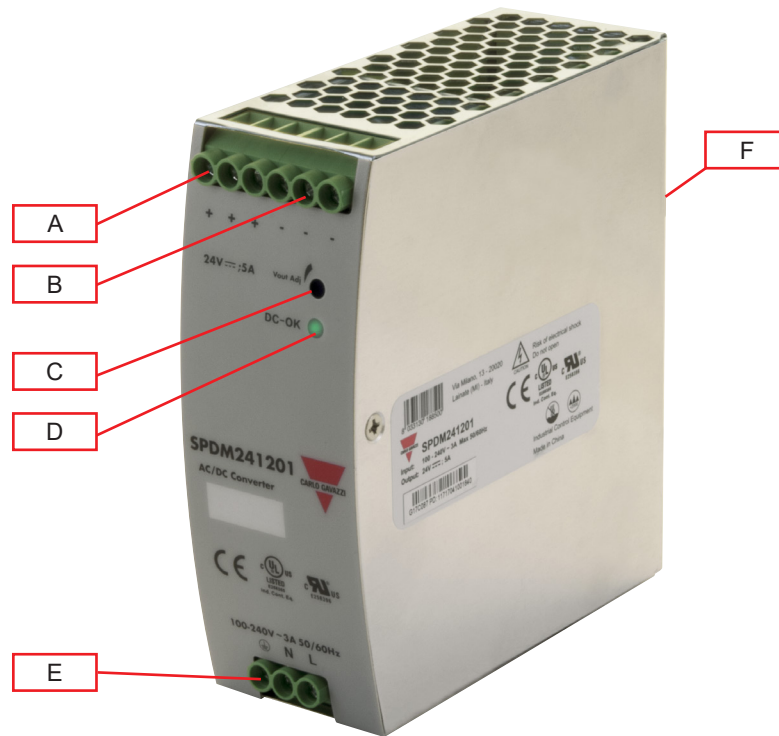
Output Voltage	120 W	240 W
12 VDC	SPDM121201	-
24 VDC	SPDM241201	SPDM242401
48 VDC	SPDM481201	SPDM482401

### Further reading

Information	Where to find it	QR
SPDM datasheet	<a href="https://www.gavazziautomation.com/images/PIM/DATASHEET/ENG/PS_SPDM_DS.pdf">https://www.gavazziautomation.com/images/PIM/DATASHEET/ENG/PS_SPDM_DS.pdf</a>	
SPDM installation sheet	<a href="https://www.gavazziautomation.com/fileadmin/images/PIM/MANUALS/ENG/SPDM_IM.pdf">https://www.gavazziautomation.com/fileadmin/images/PIM/MANUALS/ENG/SPDM_IM.pdf</a>	
SPDM 120 W CAD drawings	<a href="https://www.gavazziautomation.com/images/PIM/DRAWING/STEPP/SPDMxx1201.stp">https://www.gavazziautomation.com/images/PIM/DRAWING/STEPP/SPDMxx1201.stp</a>	
SPDM 240 W CAD drawings	<a href="https://www.gavazziautomation.com/images/PIM/DRAWING/STEPP/SPDMxx2401.stp">https://www.gavazziautomation.com/images/PIM/DRAWING/STEPP/SPDMxx2401.stp</a>	

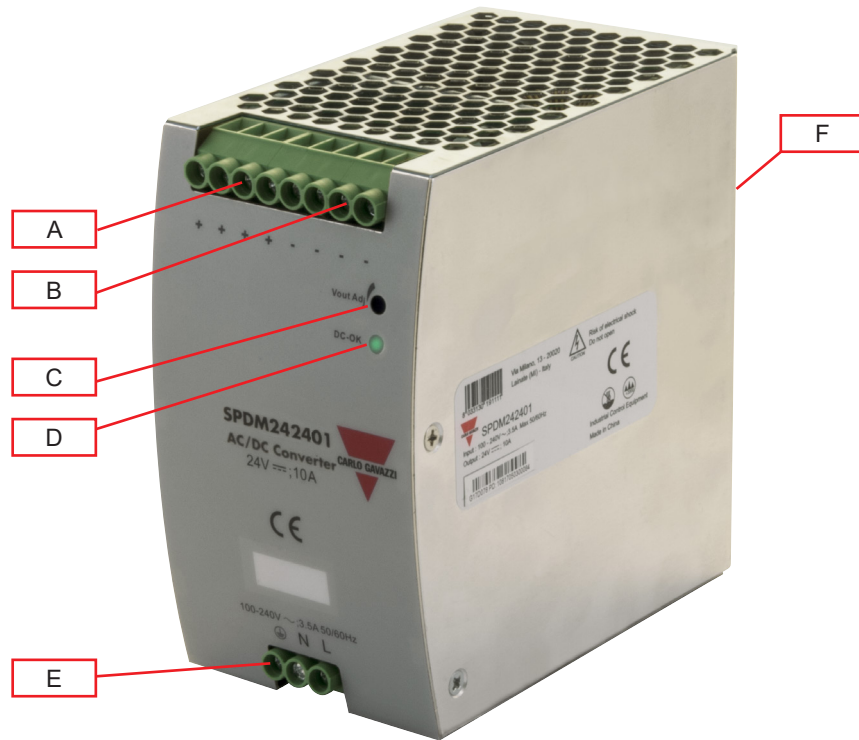
# Structure

## SPDM 120 W



Element	Component	Function
A	+ V terminals	Positive DC Output terminals
B	- V terminals	Negative DC Output terminals
C	VADJ trimmer	Output voltage adjustment
D	DC OK LED	Green when output voltage $\geq 90\%$ of rated output voltage; red when output voltage $\leq 80\%$ of rated output voltage, or, overload
E	Input terminals	L, N supply terminals and Protective Earth (PE)
F	DIN rail mounting clip	Clip present on back side

**SPDM 240 W**



Element	Component	Function
A	+ V terminals	Positive DC Output terminals
B	- V terminals	Negative DC Output terminals
C	VADJ trimmer	Output voltage adjustment
D	DC OK LED	Green when output voltage $\geq 90\%$ of rated output voltage; red when output voltage $\leq 80\%$ of rated output voltage, or, overload
E	Input terminals	L, N supply terminals and Protective Earth (PE)
F	DIN rail mounting clip	Clip present on back side

## Features

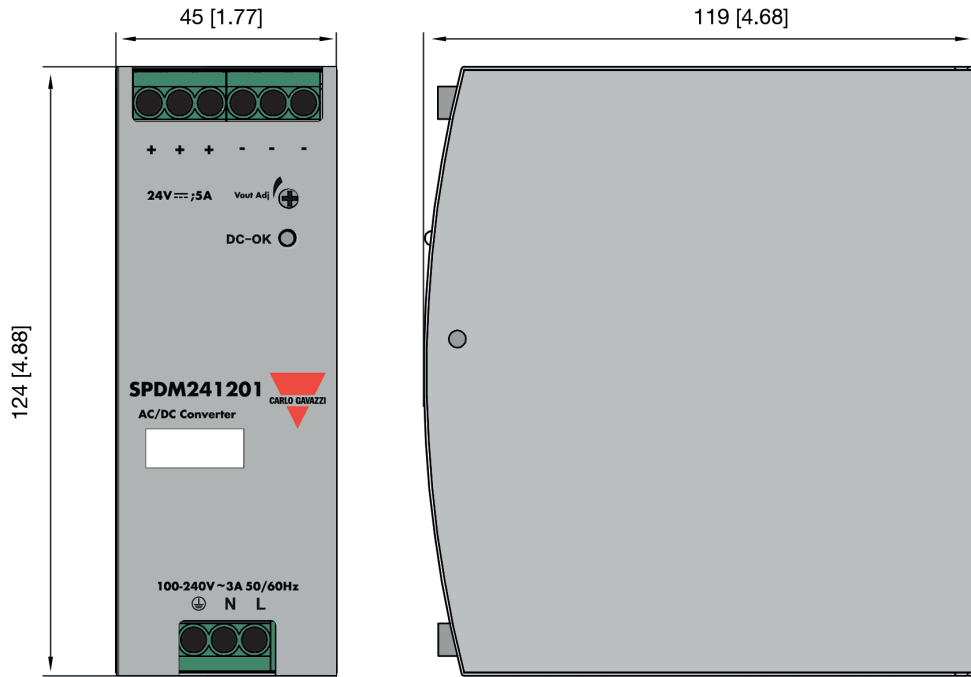
### General data

	120 W	240 W
Leakage current	<0.25 mA (Input-Output)	
Earth leakage current	<3.5 mA (Input-GND)	
Efficiency		
12 VDC	85%	-
24 VDC	88%	87%
48 VDC	89%	88%
Power loss @ nominal load	16 W @ 120 W	35 W @ 240 W
Power factor (Full Load)		
110 VAC	-	0.98
230 VAC		0.94
Ingress protection	IP20	
MTBF (MIL-HDBK-217F)	> 500,000 Hrs	> 300,000 Hrs
Case material	Metal	
Weight	590 g	940 g
Switching frequency	80 kHz	75 kHz
Mounting	DIN rail mounting	
Packing	24 pcs/CTN, 15.0 kg, 0.04 cbm	10 pcs/CTN, 11.5 kg, 0.04 cbm

**Dimensions**

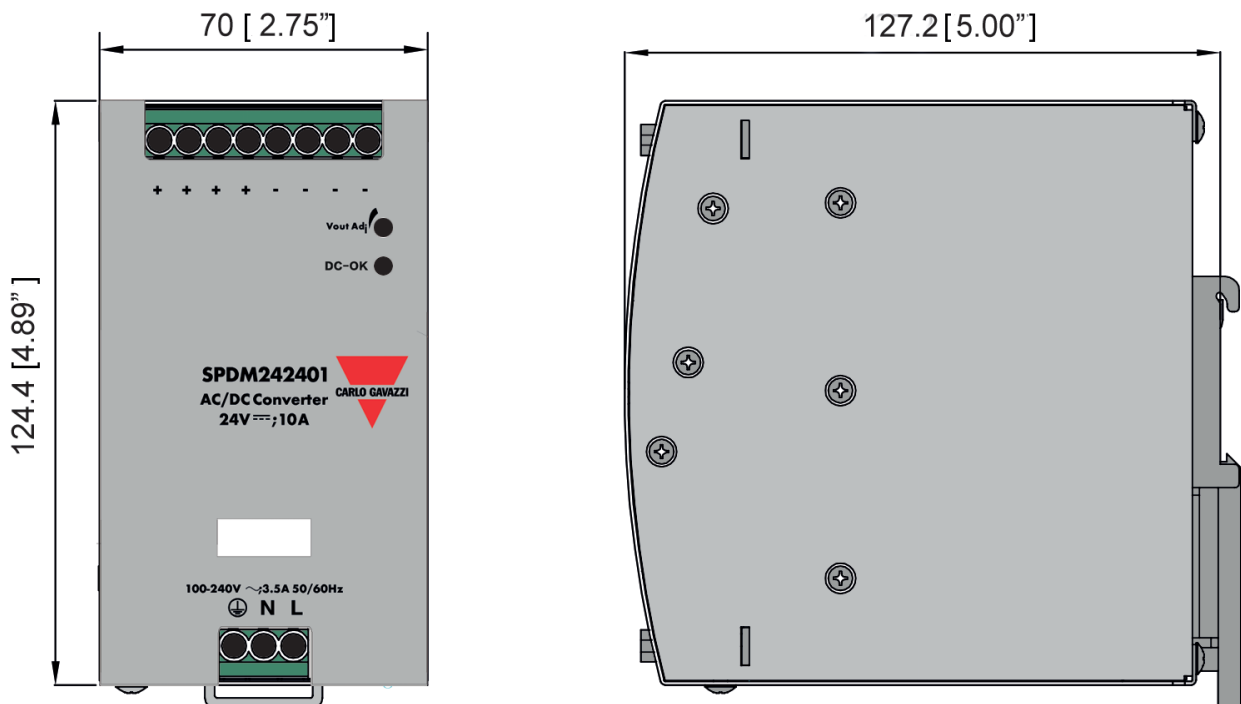
**SPDM 120 W**

Unit: mm



**SPDM 240 W**

Unit: mm

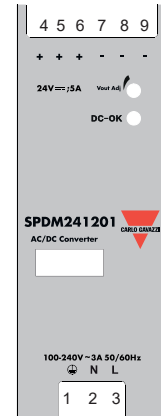


# Connection diagram

## Terminal markings

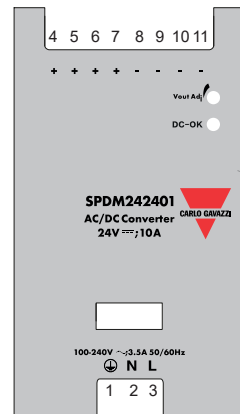
### SPDM 120W

Terminal	Designation	Description
1	Ground	Ground this terminal to minimize high frequency emissions
2	N	Input terminals (neutral conductor, no polarity with DC input)
3	L	Input terminals (phase conductor, no polarity with DC input)
4, 5, 6	V+	Positive output terminal
7, 8, 9	V-	Negative output terminal
	Vout ADJ.	Potentiometer for output voltage adjustment
	DC status	LED indication of power supply output status



### SPDM 240W

Terminal	Designation	Description
1	Ground	Ground this terminal to minimize high frequency emissions
2	N	Input terminals (neutral conductor, no polarity with DC input)
3	L	Input terminals (phase conductor, no polarity with DC input)
4, 5, 6, 7	V+	Positive output terminal
8, 9, 10, 11	V-	Negative output terminal
	Vout ADJ.	Potentiometer for output voltage adjustment
	DC status	LED indication of power supply output status



**Environmental**

	120 W	240 W
Operating temperature	-20°C to 70°C (-4°F to 158°F)	
Storage temperature	-40°C to 85°C (-40°F to 185°F)	
Humidity	20% to 90% RH No condensing	
Temperature derating	Refer to derating diagrams	
Temperature regulation	+/- 0.03%/°C	

**Compatibility and conformity**

	120 W	240 W
Safety standards	EN60950-1	
EMC emission	EN55032, EN55024	
Harmonic current	EN61000-3-2, Class A	
EMC immunity	EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11, Heavy industrial level	
CE	EN55032, EN55024	EN55032, EN55024
UL certification cULus cURus	UL508 Listed UL60950-1	-
Vibration resistance	IEC 60068-2-6	
Shock resistance	IEC 60068-2-27	




## Insulation

	120 W	240 W
Insulation / withstand voltage (input / GND)	3 kVAC , ≤10 mA	
Insulation / withstand voltage (input / output)	1.5 kVAC , ≤10 mA	
Insulation / withstand voltage (output / GND)	0.5 kVAC , ≤10 mA	
Insulation resistance	10 MΩ	
Overvoltage category	II	
Pollution degree	2	

## Input data

	120 W	240 W
Rated input voltage	100 VAC to 240 VAC	
Input voltage range	90 VAC to 264 VAC (264 VAC max.) 127 VDC to 370 VDC (370 VDC max.)	
AC current (max)		
115 VAC	<2.7 A	<3A (24 VDC), <3.5A (48 VDC)
230 VAC	<1.35 A	<2.5A (24 VDC), <2.5A (48 VDC)
Frequency range	47 Hz to 63 Hz	
Inrush current		
115 VAC	<20 A	<30 A
230 VAC	<35 A	<60 A
Internal input fuse	4 A / 250 VAC	T6.3 A / 250 VAC
Standby power consumption	<5 W	

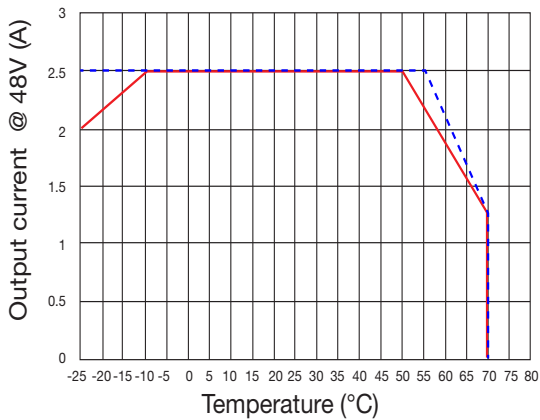
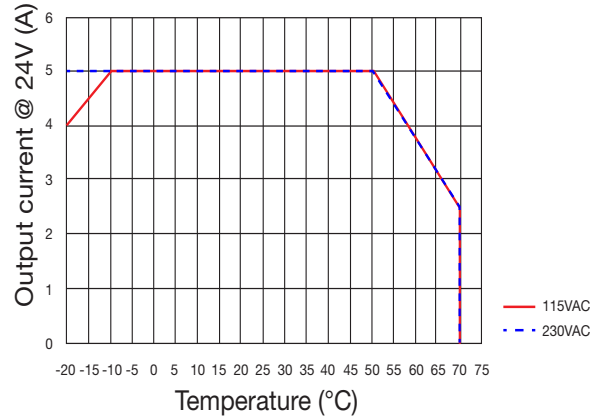
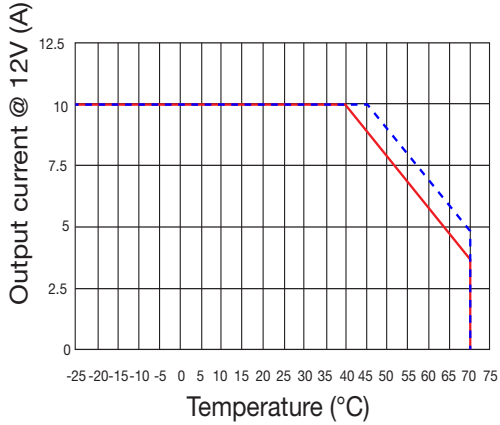

**Output data**

	<b>120 W</b>	<b>240 W</b>
<b>Output power</b>	120 W	240 W
<b>Voltage accuracy</b>	±0.5%	
<b>Line regulation</b>	±0.5%	
<b>Load regulation</b>	±1%	
<b>Voltage regulation span</b> 12 VDC 24 VDC 48 VDC	12 VDC to 14 VDC 24 VDC to 28 VDC 48 VDC to 56 VDC	24 VDC to 28 VDC 48 VDC to 56 VDC
<b>Rated output current</b> 12 VDC 24 VDC 48 VDC	10 A 5 A 2.5 A	10 A 5 A
<b>Rated continuous loading</b> 12 VDC 24 VDC 48 VDC	9 A (14 VDC) 4.5 A (28 VDC) 2.25 A (56 VDC)	9 A (28 VDC) 4.5 A (56 VDC)
<b>Ripple and noise</b>	0°C to 70°C (32°F to 158°F) ≤120 mV (12 - 24 VDC) ≤240 mV (48 VDC)  -20°C to 0°C (-13°F to 32°F) ≤240 mV (12 - 24 VDC) ≤480 mV (48 VDC)	0-70°C (32°F to 158°F) ≤120 mV (24 VDC) ≤240 mV (48 VDC)  -20°C to 0°C (-13°F to 32°F) ≤240 mV (24 VDC) ≤480 mV (48 VDC)
<b>Hold up time</b> 115 VAC 230 VAC	≥10 ms ≥20 ms	
<b>Set-up time</b> 115 VAC 230 VAC	≤3 ms ≤1.2 s	≤2 s
<b>Rise time</b>	<60 ms	<100 ms
<b>Turn-on overshoot</b>	<5.0%	
<b>Overshoot and undershoot</b>	≤5.0%	
<b>Series operation</b>	Yes	
<b>Parallel operation</b>	No	
<b>Power Boost</b>	No	

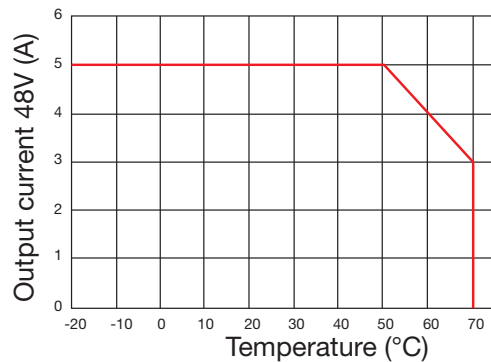
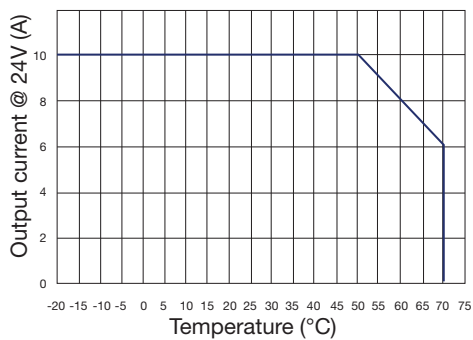
# Performance

## Current derating

### SPDM 120W 12VDC / 24VDC / 48VDC

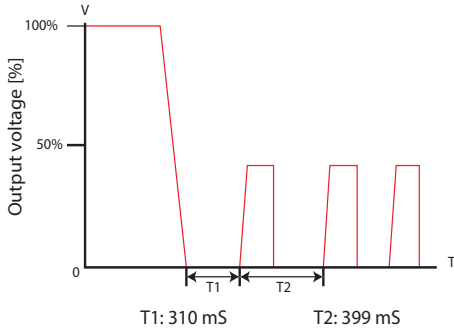


### SPDM 240W 24VDC / 48VDC

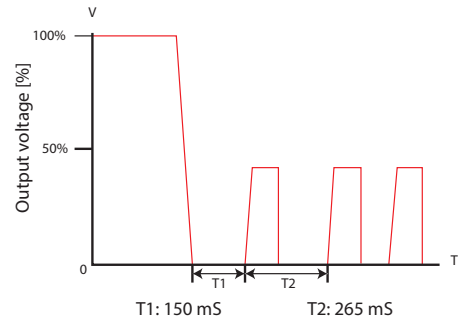


Typical current limiting curve

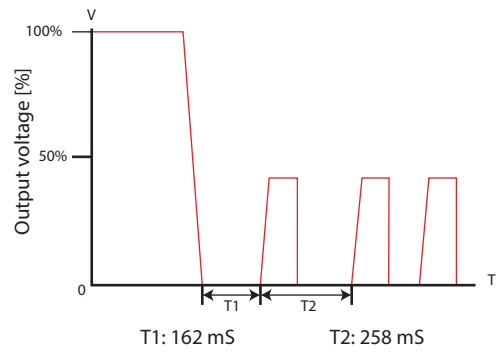
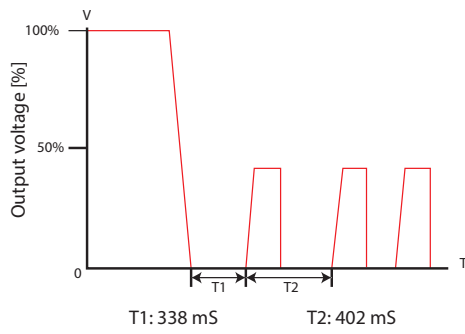
SPDM 120W 12VDC / 24VDC / 48VDC @ 110 VAC



SPDM 120W 12VDC / 24VDC / 48VDC @ 230 VAC

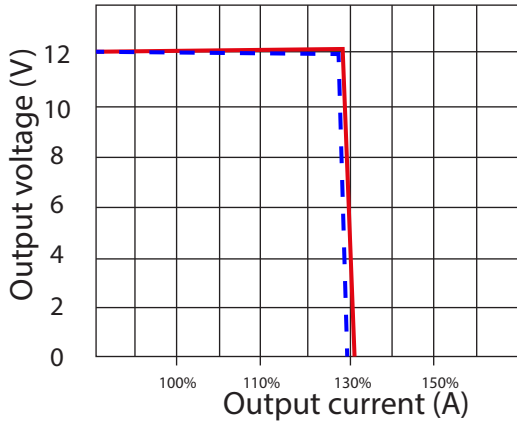


SPDM 240W 24VDC / 48VDC @ 230VAC

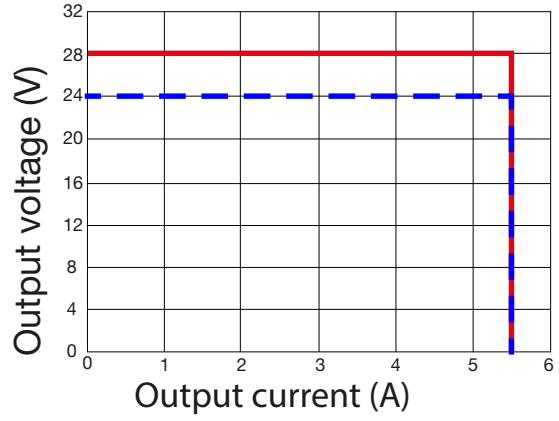


Output characteristics

SPDM 120W 12VDC



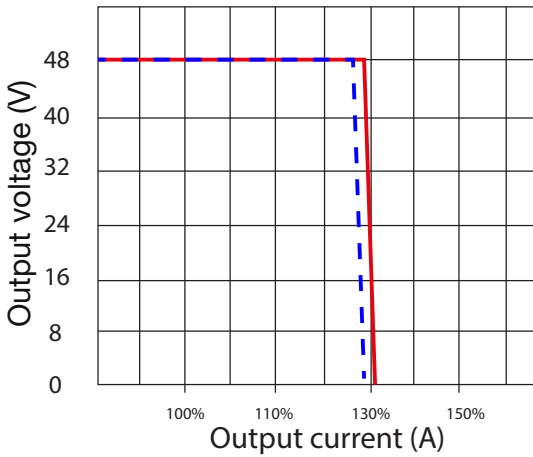
SPDM 120W 24VDC



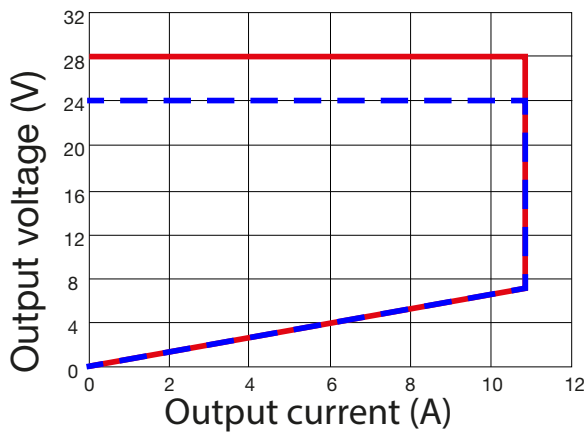
@ 110VAC

@ 230VAC

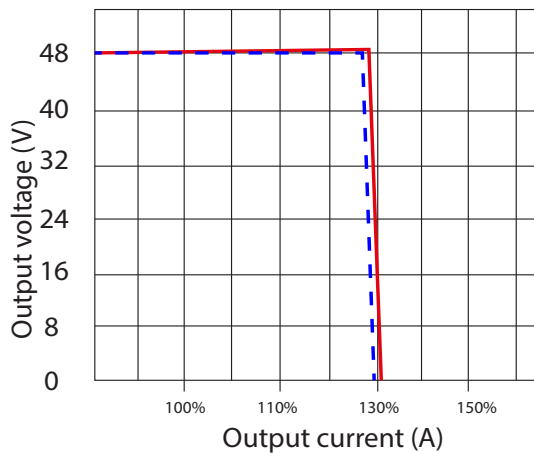
SPDM 120W 48VDC



SPDM 240W 24VDC

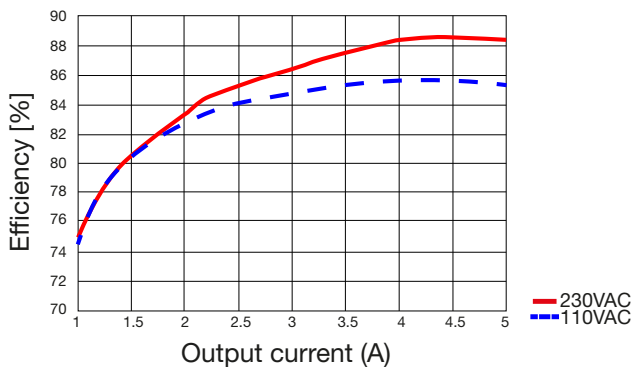


SPDM 240W 48VDC

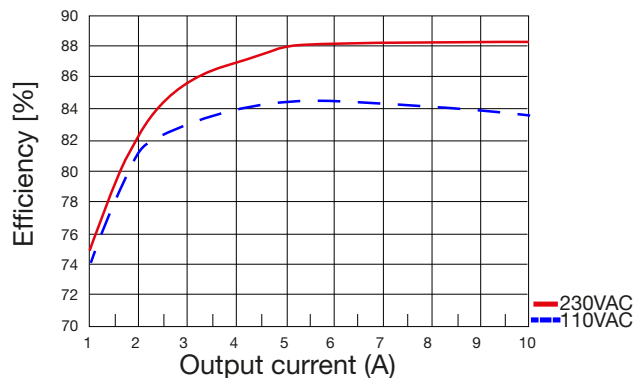


Typical efficiency curve

SPDM 120W 12VDC / 24VDC / 48VDC



SPDM 240W 24VDC / 48VDC



Installation

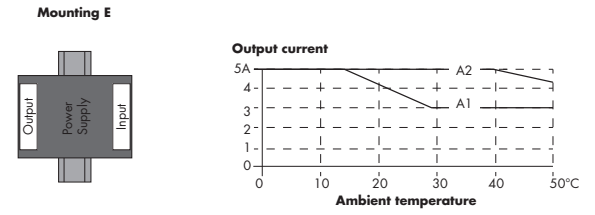
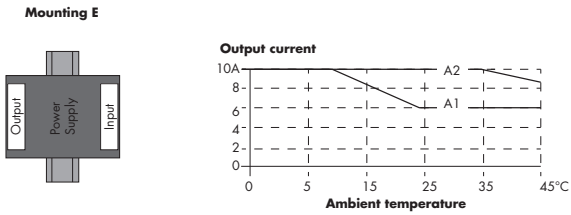
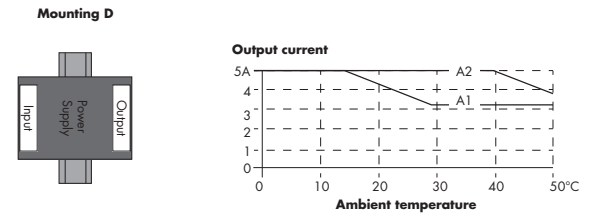
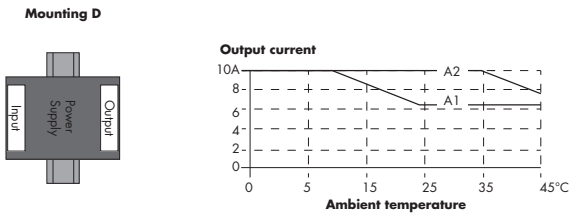
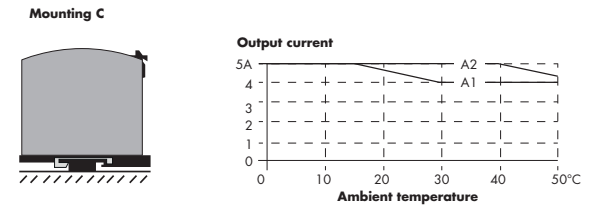
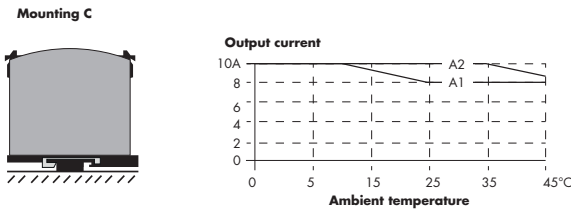
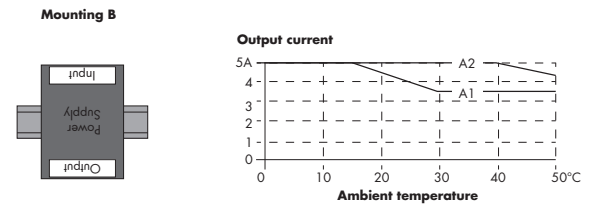
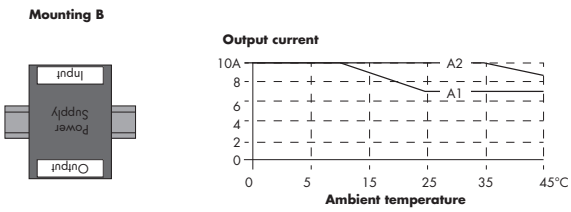
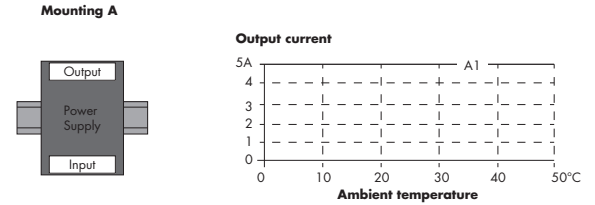
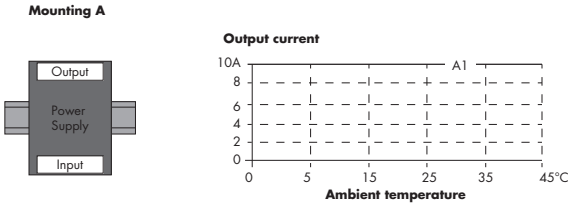
	120 W	240 W
Ventilation and cooling	Normal air convection; 25 mm of free space on each side is recommended	

**Mounting method instruction**

A1 is recommended output current, A2 is the allowed max output current (PSU lifetime is around half of A1)

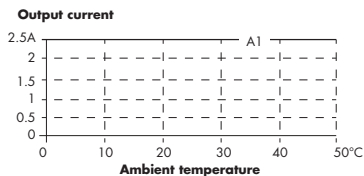
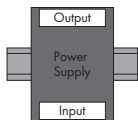
**SPDM 120 W / 12 VDC**

**SPDM 120 W / 24 VDC**

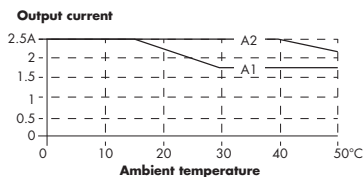
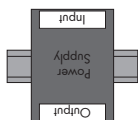


**SPDM 120 W / 48 VDC**

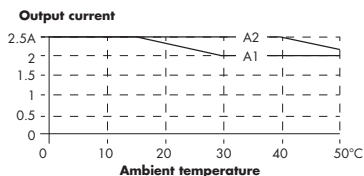
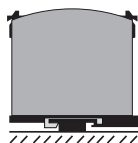
**Mounting A**



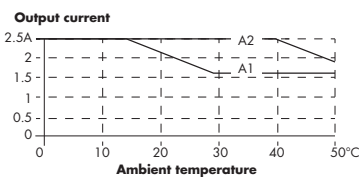
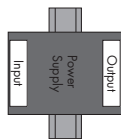
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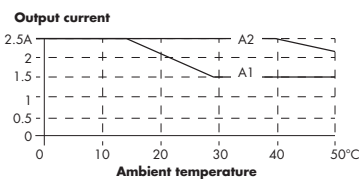
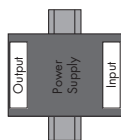
**Mounting C**



**Mounting D**



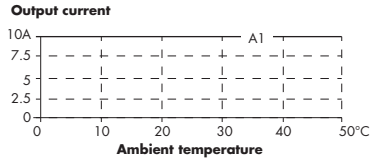
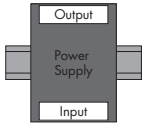
**Mounting E**



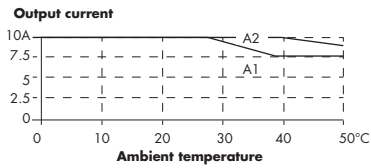
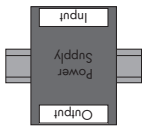


**SPDM 240 W / 24 VDC**

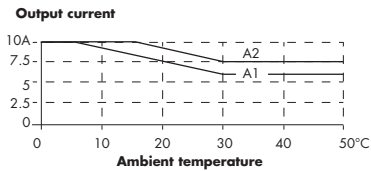
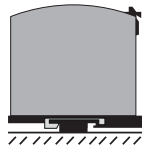
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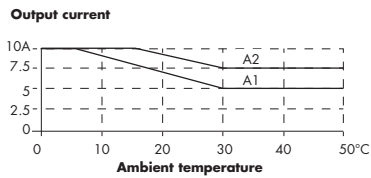
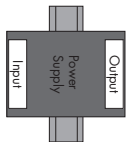
**Mounting B**



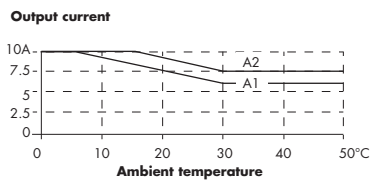
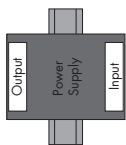
**Mounting C**



**Mounting D**

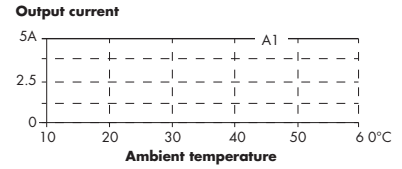
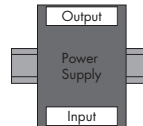


**Mounting E**

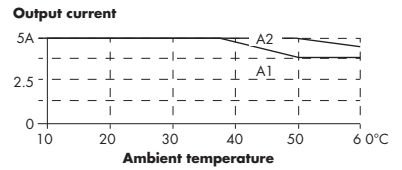
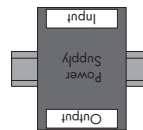


**SPDM 240W / 48 VDC**

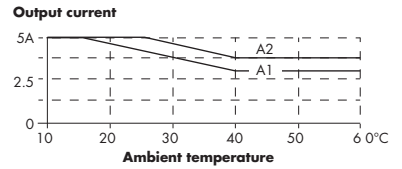
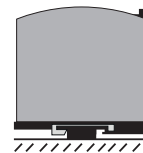
**Mounting A**



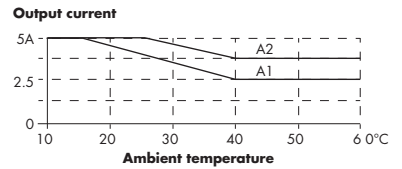
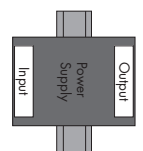
**Mounting B**



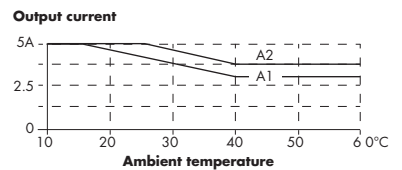
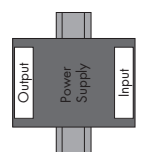
**Mounting C**



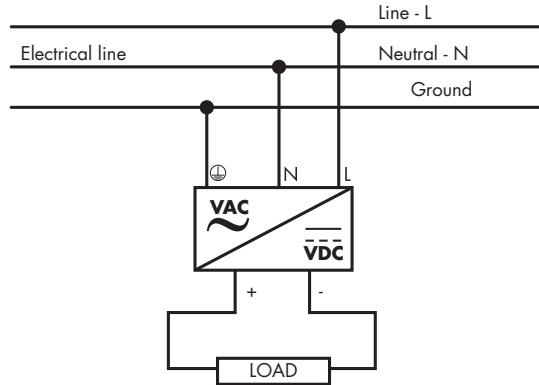
**Mounting D**



**Mounting E**



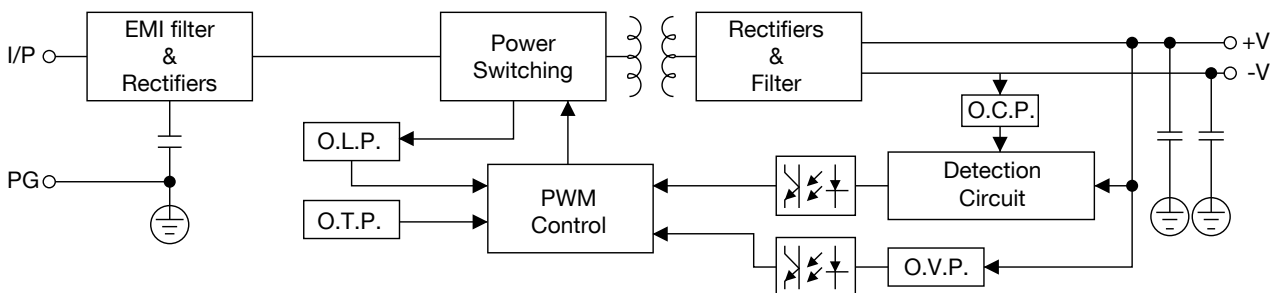
**Wiring diagram**



**Connection specification**

	120 W	240 W
Terminal type	Input 6.35 mm, 3 pin screw terminals	
Screw driver blade	3.5 mm slotted or cross screwdriver	
Tightening torque (recommended)	5 Nm	
Flexible conductor cross section max	4 mm <sup>2</sup>	
Flexible conductor cross section min	0.5 mm <sup>2</sup>	
Conductor cross section AWG max	AWG20 (PG wire >18 AWG)	
Conductor cross section AWG min	AWG10 (PG wire >18 AWG)	
Rigid conductor cross-section min	6 mm <sup>2</sup>	
Rigid conductor cross-section max	0.5 mm <sup>2</sup>	
Max wire diameter	2.8 mm <sup>2</sup>	

**Block diagram**



## Troubleshooting

### ▶ Signaling and controls

	120 W	240 W
DC OK LED	Green	
DC OK output type	No	

## Operating description

### ▶ Control and protection

	120 W	240 W
<b>Overvoltage protection</b>		
12 VDC	15 - 18 VDC	
24 VDC	29 - 33 VDC	28 - 35 VDC
48 VDC	58 - 63 VDC	58 - 63 VDC
<b>Overload protection</b>		
12 VDC	10.5 - 13 A	
24 VDC	5.25 - 6.5 A	10.3 - 11.5 A
48 VDC	2.75 - 3.25 A	5.55 - 6.5 A
<b>Current limiting</b>	-	
<b>Short circuit protection</b>	Long-term mode, auto recovery	
<b>Over temperature protection</b>	100 ± 5°C, detect on heat sink of power transistor; shut down O/P, re-power on	
<b>Internal voltage surge protection</b>	NTC	
<b>Reverse voltage protection</b>	No	

## Glossary



**CE:** "Conformité Européene" or "European Conformity" ; Indicates the manufacturer declaration of conformity that the product meets the relevant health, safety and environmental protection requirements of the applicable EC directives.



**cULus:** This certification mark is based on the UL508 - Standard for Industrial Control Equipment. The UL508 standard covers industrial control and auxiliary devices for starting, stopping, regulating, controlling, or protecting electric motors. In addition, UL508 also covers devices rated 1500 volts or less. Industrial control equipment covered by these requirements is intended for use in an ambient temperature of 0°C – 40°C (32 – 104°F).



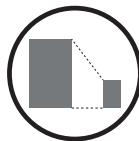
**cRUus:** This certification mark is based on the UL60950-1 ; Information Technology Equipment - Safety - Part 1. The UL60950-1 is applicable to mains-powered or battery-powered information technology equipment, including electrical business equipment and associated equipment, with a RATED VOLTAGE not exceeding 600 V.



**Economical:** The SPDM is the most economical power supply, offering features and spacing while lowering the cost.



**Spring Terminals:** The SPDM 30W, 50W and 75W provide the option of spring terminals, saving installation time by up to 50%.



**Reduced dimension:** The footprint is reduced with the SPDM, saving up to 30% space when compared to others.