

Enclosed Switching Power Supply



Description

Enclosed Switching Power Supply for AC/DC and DC/DC power requirement. The new SPPE family provides flexible OEM power solutions for industrial control and automation applications. This series is available with range from 25 W to 350 W, and from 12 V to 24 V. All the range carries full certification offering a wide range of universal input and screw terminal connections.

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

Benefits

- **Universal AC, DC input range.** SPPE Series can be powered with AC Voltage (80-85-90 VAC to 264-305 VAC) or with DC Voltage (100-240 VDC to 370-430 VDC).
- **Reliable power in very compact dimensions.** SPPE offers high compactness, miniature size, long life and high power density, efficiency and reliability.
- **Reliable critical protection.** The operation safety is guaranteed by the various output protections: Over Voltage (OVC), Over Load (OLP), Short Circuit (SCP), Over Power (OVP) and Over Temperature (OTP) depending on the model.
- **Built-in features.** All SPPE models come with the DC OK LED.
- **Wide operating and isolation ranges.** The operating temperature range is from -30/-40°C to +70/+85°C, depending on the model.
- **High altitude.** SPPE series assures the operating altitude up to 5000m and high I/O isolation voltage up to 4000 VAC, with OVC III.

Applications

This product is suitable for all applications which require single-phase power supply with universal AC or DC voltage input range, high efficiency and high compactness for panel mounting solution. Installations with limited panel space, industrial equipment, machinery.

Main functions

- High efficiency up to 91.5%
- Universal AC, DC input voltage range
- 25 W, 35 W, 50 W, 75 W, 150 W, 200 W, 350 W

References

Order code



SPPE 1



Enter the code entering the corresponding option instead of .

Code	Option	Description	Notes
S	-	Switching	Device typology
P	-	Power supply	
P	-	Panel mount	
E	-	High efficiency	Mounting
<input type="checkbox"/>	12	12 VDC	Rated output voltage
	24	24 VDC	
<input type="checkbox"/>	25	25 W	Rated output power
	35	35 W	
	50	50 W	
	75	75 W	
	150	150 W	
	200	200 W	
1	350	350 W	Input type
	-	Single phase input	

Selection guide

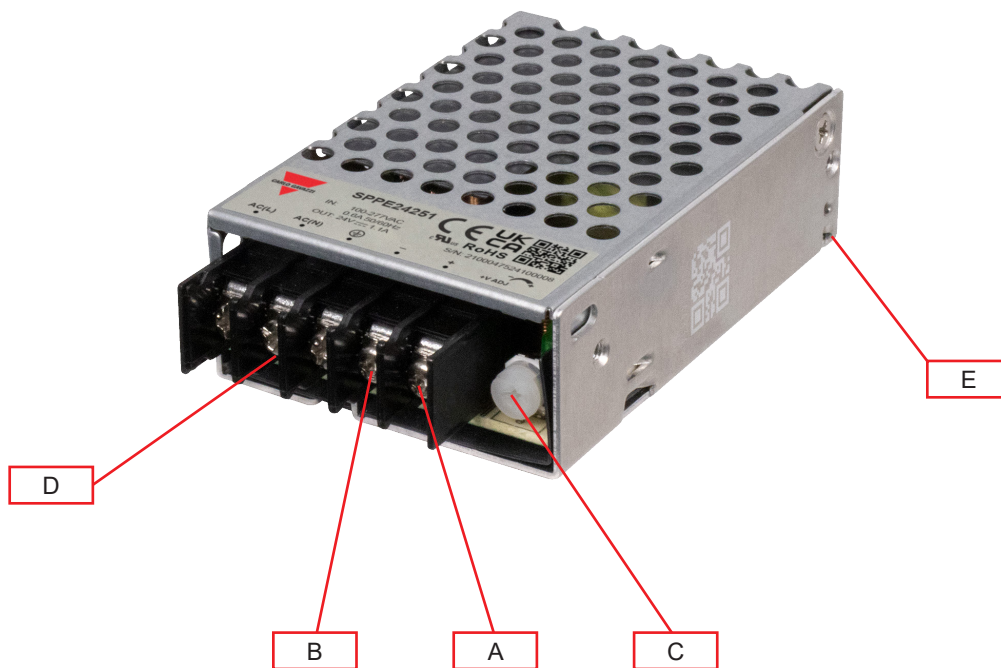
Output Voltage	Output power						
	25 W	35 W	50 W	75 W	150 W	200 W	350 W
12 VDC	SPPE12251	SPPE12351	SPPE12501	SPPE12751	SPPE121501	SPPE122001	SPPE123501
24 VDC	SPPE24251	SPPE24351	SPPE24501	SPPE24751	SPPE241501	SPPE242001	SPPE243501

Further reading

Information	Where to find it	QR
SPPE Data sheet	https://gavazziautomation.com/images/PIM/DATASHEET/ENG/SPPE_DS_EN.pdf	
SPPE Instruction manual	https://gavazziautomation.com/images/PIM/MANUALS/ENG/SPPE_IM.pdf	

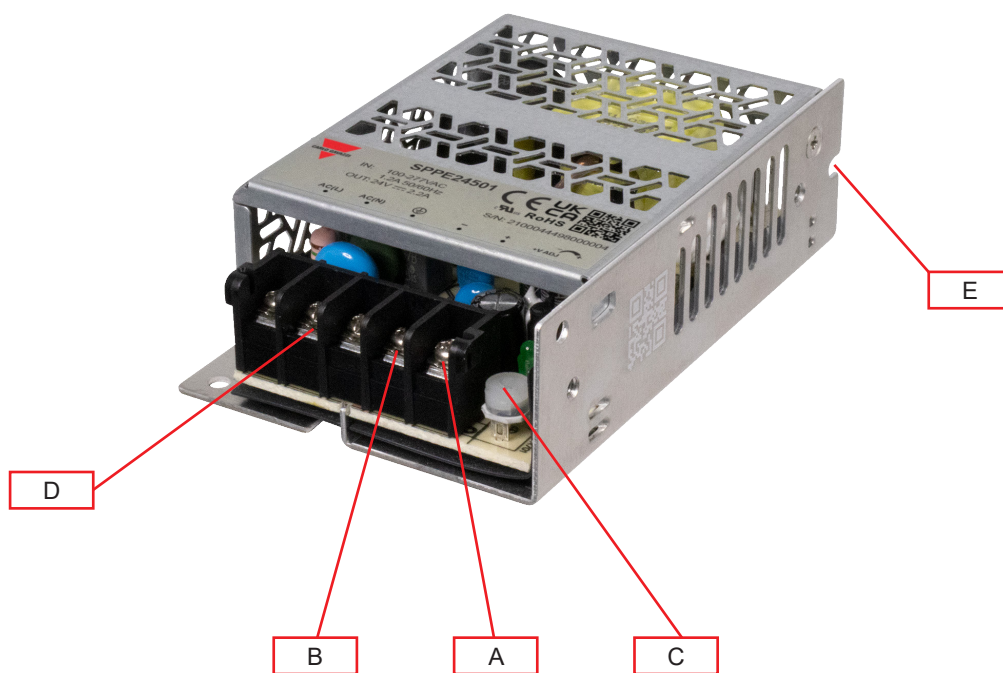
Structure

SPPE 25 W



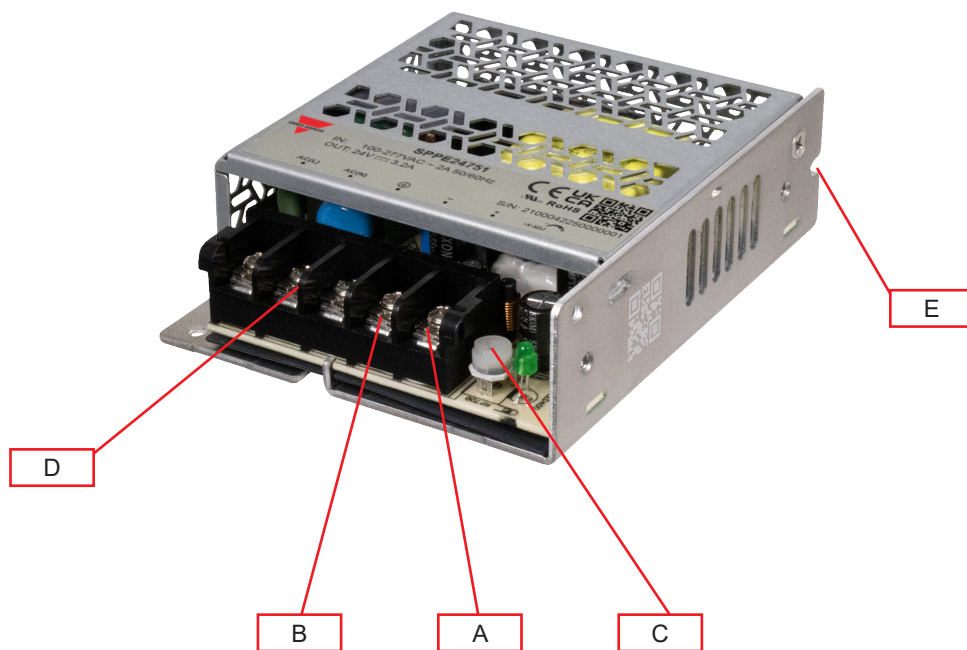
Element	Component	Function
A	+ V terminals	Positive DC output terminals
B	- V terminals	Negative DC output terminals
C	VADJ Trimmer	Output voltage adjustment
D	Power supply terminals	L, N supply terminals + GND
E	Panel Mounting Predisposition	Predispositions present on two sides

SPPE 35 / 50 W



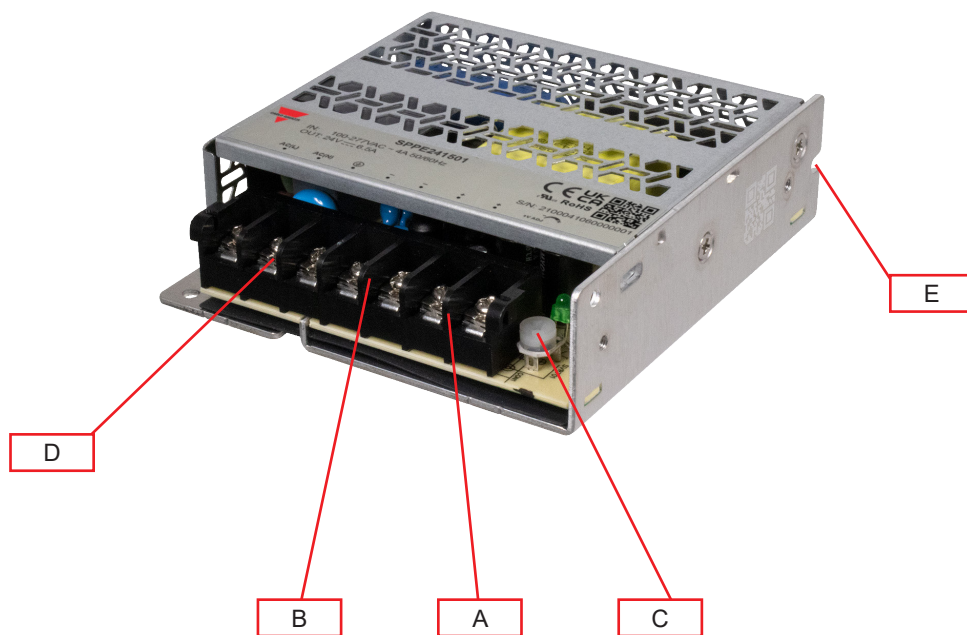
Element	Component	Function
A	+ V terminals	Positive DC output terminals
B	- V terminals	Negative DC output terminals
C	VADJ Trimmer	Output voltage adjustment
D	Power supply terminals	L, N supply terminals + GND
E	Panel Mounting Predisposition	Predispositions present on two sides

SPPE 75 W



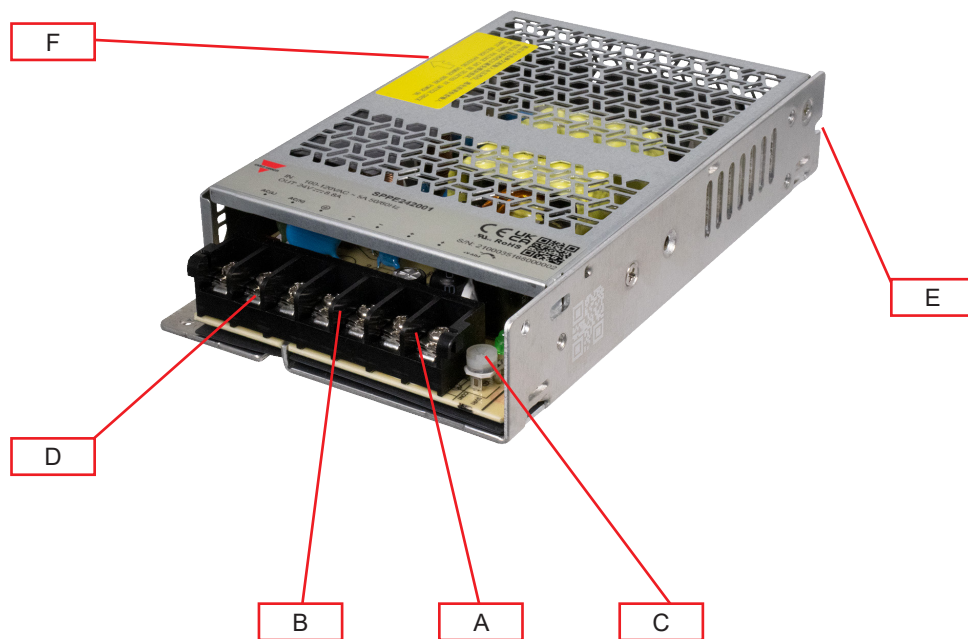
Element	Component	Function
A	+ V terminals	Positive DC output terminals
B	- V terminals	Negative DC output terminals
C	VADJ Trimmer	Output voltage adjustment
D	Power supply terminals	L, N supply terminals + GND
E	Panel Mounting Predisposition	Predispositions present on two sides

SPPE 150 W



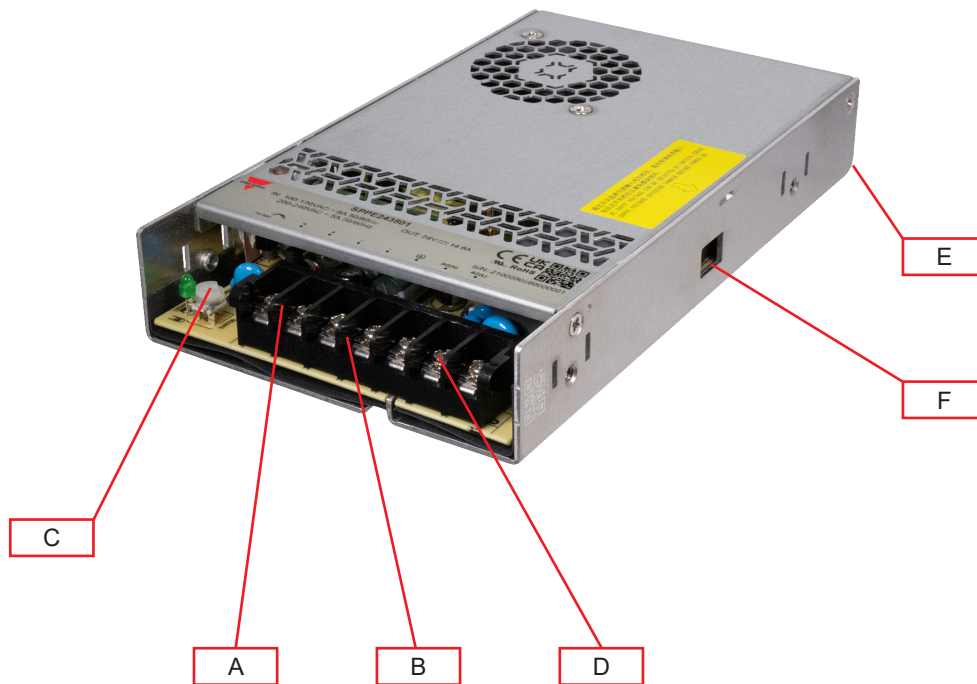
Element	Component	Function
A	+ V terminals	Positive DC output terminals
B	- V terminals	Negative DC output terminals
C	VADJ Trimmer	Output voltage adjustment
D	Power supply terminals	L, N supply terminals + GND
E	Panel Mounting Predisposition	Predispositions present on two sides

SPPE 200 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	Power supply terminals	L, N supply terminals + GND
E	Panel Mounting Predisposition	Predispositions present on two sides
F	Switch	AC/DC input voltage switch

SPPE 350 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	Power supply terminals	L, N supply terminals + GND
E	Wall Mounting Predisposition	Predispositions present on two sides
F	Switch	AC/DC input voltage switch

Features

General data

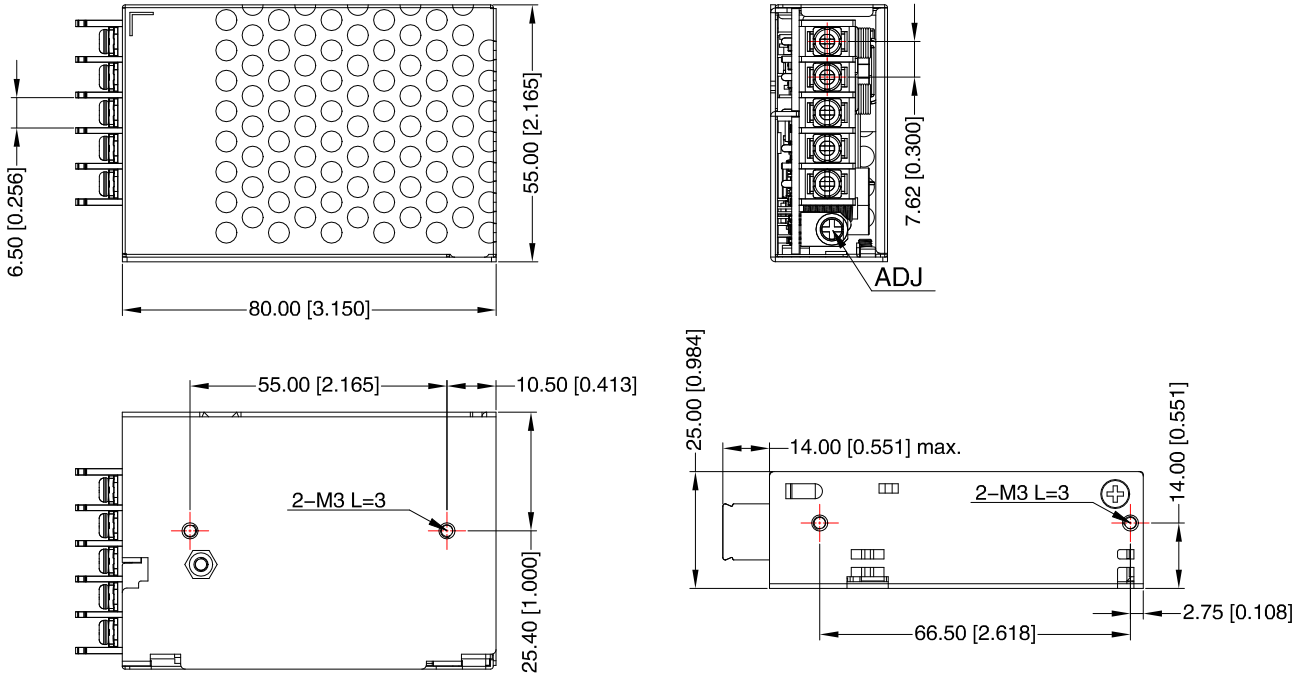
		25 W	35 W	50 W	75 W
Leakage current		< 0.5 mA (277 VAC)	< 0.75 mA (277 VAC)		
Efficiency @230 VAC	12 VDC	85 %	87.5 %	88 %	89 %
	24 VDC	86 %	88.5 %	89.5 %	91 %
Power loss @ nominal load	12 VDC	4.45 W	5.14 W	6.95 W	8.90 W
	24 VDC	4.15 W	4.68 W	6.19 W	7.60 W
Switching frequency		65 kHz	95 kHz	90 kHz	<150 kHz
Ingress protection		IP20			
MTBF (MIL-HDBK-217F)		>450,000 h	>300,000 h		
Case material		Metal			
Weight		115 g (0.25 lb)	150 g (0.33 lb)	220 g (0.49 lb)	
Mounting		Panel mounting			

		150 W	200 W	350 W
Leakage current		< 0.5 mA (277 VAC)	< 0.75 mA (240 VAC)	< 0.5 mA (touch) < 2.0 mA (earth)
Efficiency @230 VAC	12 VDC	91.5 %	89 %	85.5 %
	24 VDC		91 %	88 %
Power loss @ nominal load	12 VDC	13.93 W	25.21 W	59.02 W
	24 VDC	14.49 W	20.89 W	47.78 W
Switching frequency		90 kHz	-	65 kHz
Ingress protection		IP20		
MTBF (MIL-HDBK-217F)		>300,000 h		
Case material		Metal		
Weight		270 g (0.60 lb)	415 g (0.92 lb)	570 g (1.26 lb)
Mounting		Panel mounting		

Dimensions

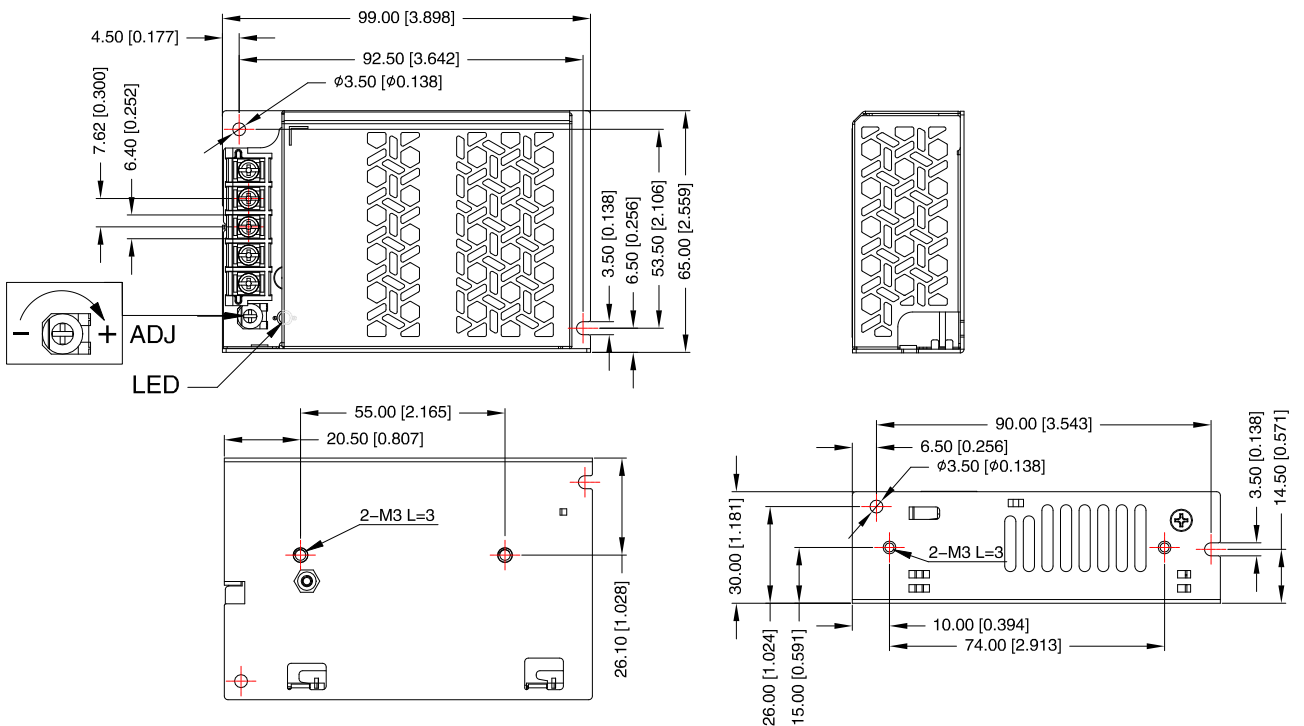
SPPE 25 W

Unit: mm [inch]

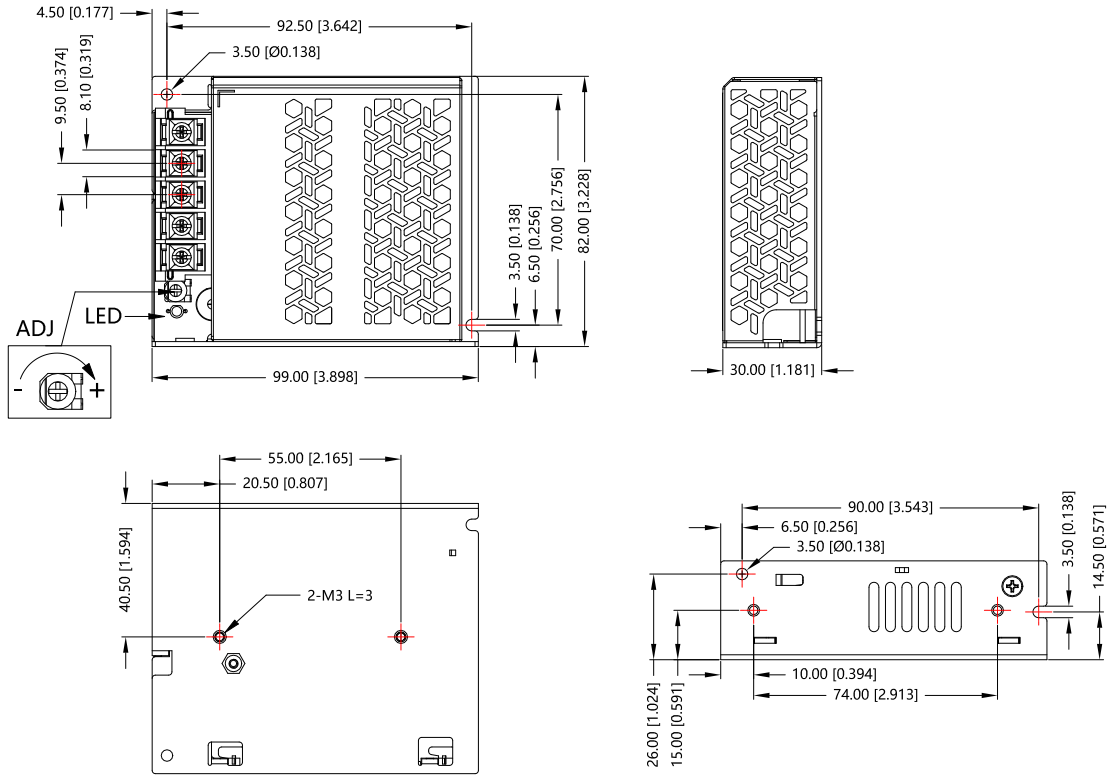


SPPE 35 / 50 W

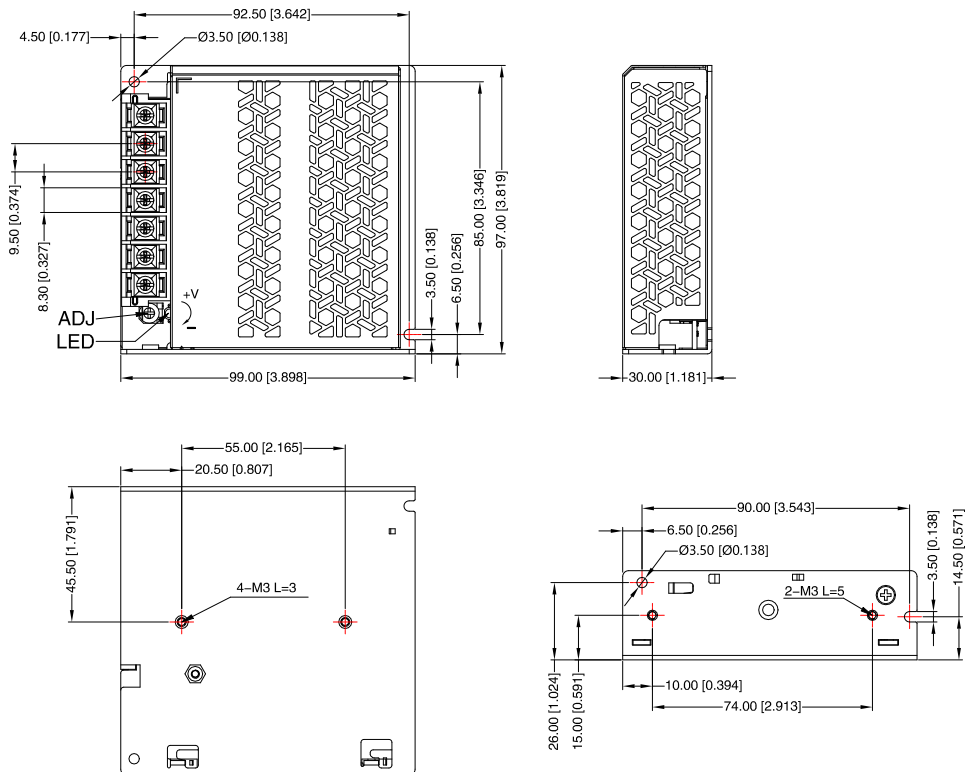
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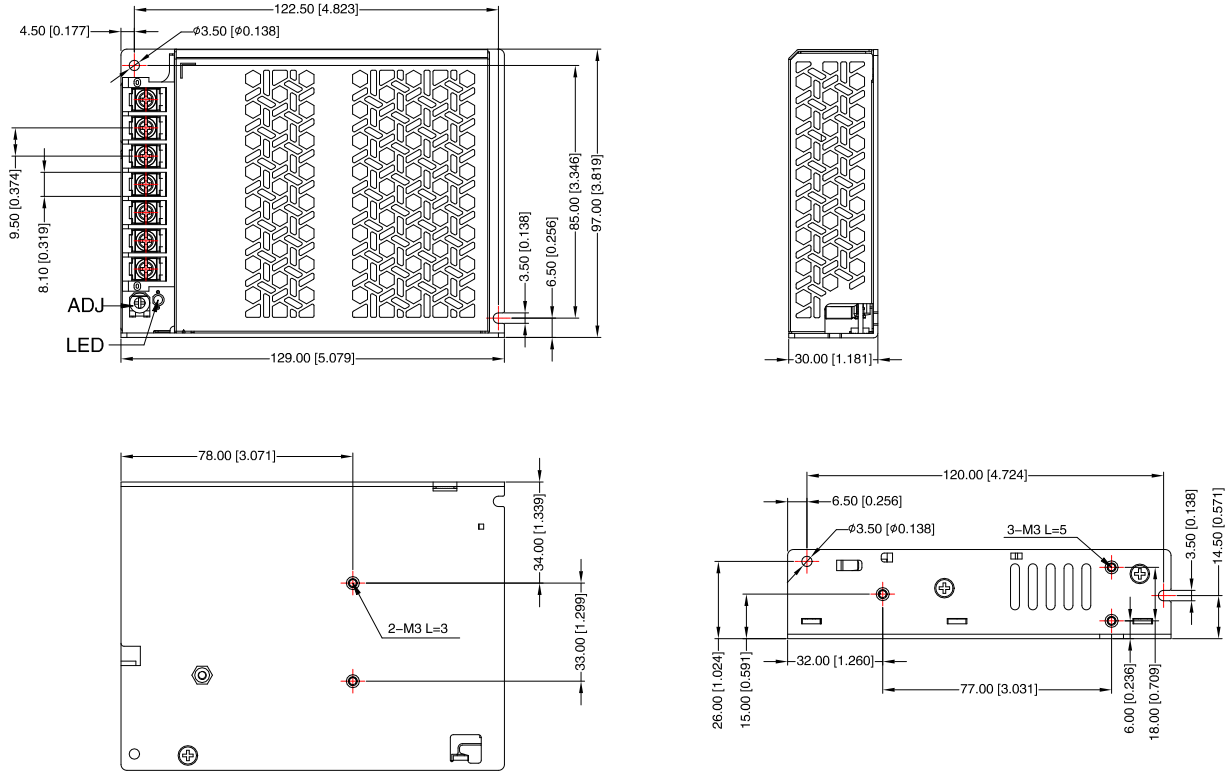
SPPE 75 W
Unit: mm [inch]



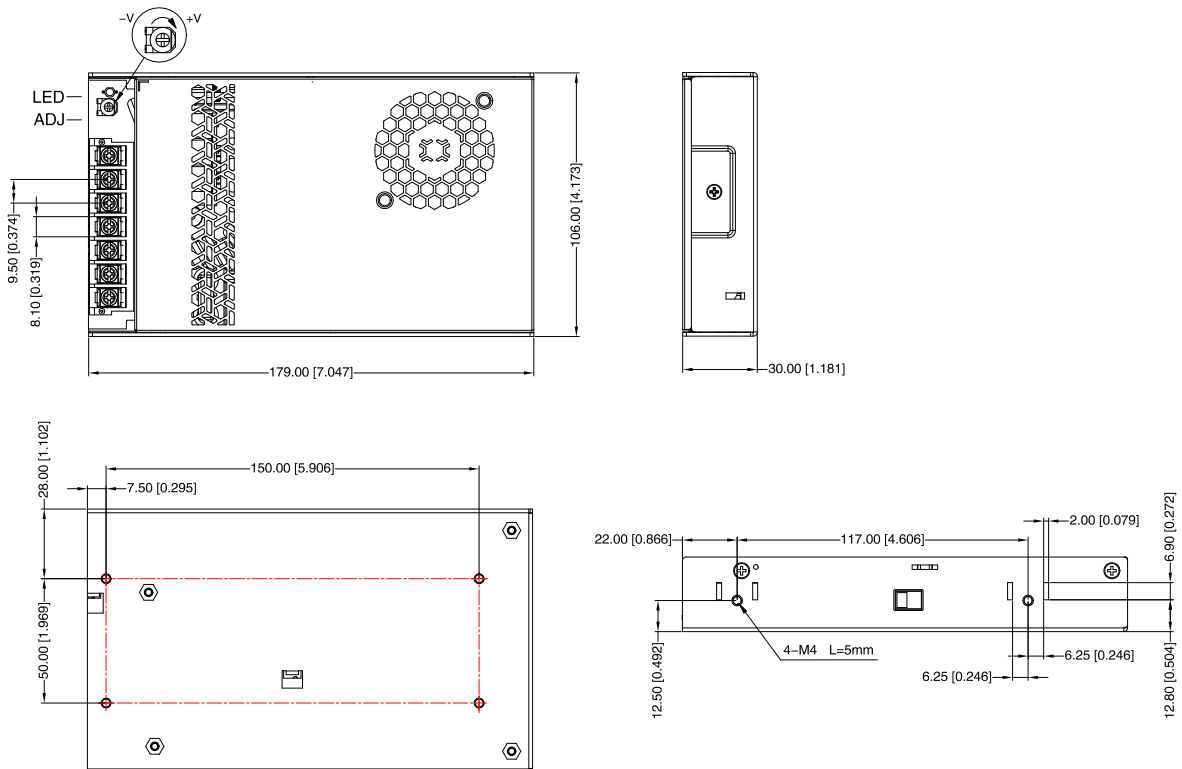
SPPE 150 W
Unit: mm [inch]



SPPE 200 W
Unit: mm [inch]



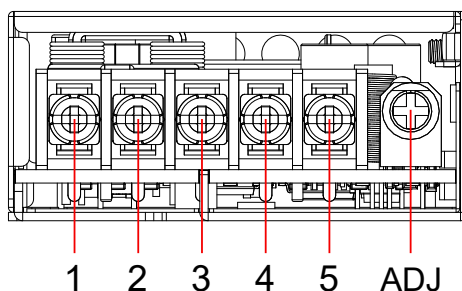
SPPE 350 W
Unit: mm [inch]



Connection diagram

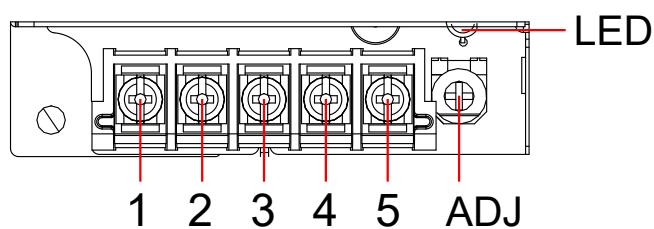
Terminal markings

SPPE 25 W



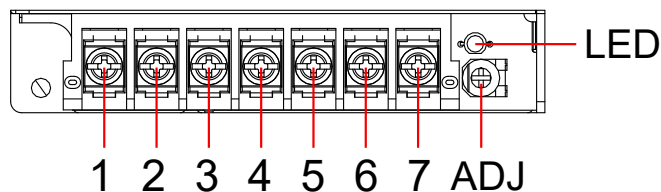
Terminal	Designation	Description
1	AC(L)	Input terminals (phase conductor, no polarity with DC input)
2	AC(N)	Input terminals (neutral conductor, no polarity with DC input)
3	PE	Ground this terminal to minimize high frequency emissions
4	-V _o	Negative output terminal
5	+V _o	Positive output terminal
	Vout ADJ	Potentiometer for output voltage adjustment

SPPE 35 / 50 / 75 W



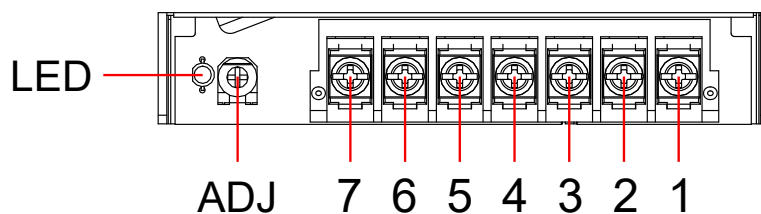
Terminal	Designation	Description
1	AC(L)	Input terminals (phase conductor, no polarity with DC input)
2	AC(N)	Input terminals (neutral conductor, no polarity with DC input)
3	PE	Ground this terminal to minimize high frequency emissions
4	-V _o	Negative output terminal
5	+V _o	Positive output terminal
	Vout ADJ	Potentiometer for output voltage adjustment

SPPE 150 / 200 W



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

SPPE 350 W



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



Environmental

	25 W	35 W	50 W	75 W
Operating temperature	-30°C to 70°C (-22°F to 158°F)	-40°C to 85°C (-40°F to 185°F)		
Storage temperature	-40°C to 85°C (-40°F to 185°F)			
Operating humidity	20 - 90 % RH non-condensing			
Storage humidity	< 95 % RH non-condensing			
Operating altitude	5000 m			
Temperature derating	Refer to derating diagram			
Ventilation and cooling	Cooling by free air convection			


	150 W	200 W	350 W
Operating temperature	-40°C to 85°C (-40°F to 185°F)		
Storage temperature			
Operating humidity	< 95 % RH non-condensing	20 - 90 % RH non-condensing	
Storage humidity		10 - 95 % RH non-condensing	
Operating altitude	5000 m		
Temperature derating	Refer to derating diagram		
Ventilation and cooling	Cooling by free air convection		Forced air cooling



Compatibility and conformity

	25 W	35 W	50 W	75 W
Safety standards	EN61558-1 EN61558-2-2 EN61558-2-16 EN61204-7 UL/EN62368-1 IS13252 (Part1) safety approved EN60335 OVCII	EN61558-1 EN61558-2-2 EN61558-2-16 EN61204-7 UL/EN62368-1 EN62477-1 EN60335 OVCII	EN61558-1 EN61558-2-2 EN61558-2-16 EN61204-7 UL/EN62368-1 EN62477-1 EN60335 OVCII	EN61558-1 EN61558-2-2 EN61558-2-16 EN61204-7 UL/EN62368-1 EN62477 EN60335 OVCII
Approvals				
Conducted (CS) IEC/EN 61000-4-6	10 Vrms (PC A)			
Voltage dips IEC/EN61000-4-11	0% (PC B)			
Voltage interruptions IEC/EN61000-4-11	70% (PC B)			
EMC emission CE: CISPR32/EN55032 RE: CISPR32/EN55032	Class B Class B			
Harmonic current IEC/EN61000-3-2	-			Class A
EMC immunity ESD: IEC/EN 61000-4-2 RS: IEC/EN 61000-4-3 EFT: IEC/EN 61000-4-4 Surge: IEC/EN 61000-4-5	contact ± 6 kV / air ± 8 kV 10 V/m ± 2 kV line to line ±1 kV line to ground ±2 kV	contact ± 6 kV / air ± 8 kV 10 V/m ± 4 kV line to line ±2 kV line to ground ±4 kV		

Compatibility and conformity (continued)

	150 W	200 W	350 W
Safety standards	EN61558-1, EN61558-2-2, EN61558-2-16, EN61204-7, UL/EN62368-1, EN62477	EN61558-1, EN61558-2-2, EN61558-2-16, EN61204-7, UL/EN62368-1, EN62477-1	
Approvals			
Conducted (CS) IEC/EN 61000-4-6	10 Vrms (PC A)		
Voltage dips IEC/EN61000-4-11	30% for 25 cycles 100% for 1 cycle (PC B)	0% (PC B) 70% (PC B)	0% (PC B) 70% (PC B)
Voltage interruptions IEC/EN61000-4-11	100% for 250 cycles (PC B)		0% of 230 VAC (PC A) 0% for 5000 ms (PC B)
EMC emission CE: CISPR32/EN55032 RE: CISPR32/EN55032	Class B Class B	Class A Class A	
Harmonic current IEC/EN61000-3-2	-		
EMC immunity ESD: IEC/EN 61000-4-2 RS: IEC/EN 61000-4-3 EFT: IEC/EN 61000-4-4 Surge: IEC/EN 61000-4-5 PFMF: IEC/EN 61000-4-8	contact ± 6 kV / air ± 8 kV 10 V/m ± 4 kV line to line ±2 kV line to ground ±4 kV 30 A/m	contact ± 6 kV / air ± 8 kV 10 V/m ± 2 kV line to line ±2 kV line to ground ±4 kV 30 A/m	contact ± 6 kV / air ± 8 kV 10 V/m ± 4 kV line to line ±2 kV line to ground ±4 kV 30 A/m



Insulation

	25 W	35 W	50 W	75 W
Insulation / withstand voltage (input / GND)	2.0 kVAC / < 10 mA	2.0 kVAC / < 5 mA		
Insulation / withstand voltage (input / output)	4.0 kVAC / < 10 mA	4.0 kVAC / < 5 mA		
Insulation / withstand voltage (output / GND)	1.25 kVAC / < 10 mA	1.25 kVAC / < 5 mA		
Insulation resistance	≥ 100 MΩ			
Overvoltage category	III			
Pollution degree	2			

	150 W	200 W	350 W
Insulation / withstand voltage (input / GND)	4.0 kVAC / < 5 mA	2.0 kVAC / < 5 mA	4.0 kVAC / < 5 mA
Insulation / withstand voltage (input / output)	2.0 kVAC / < 5 mA	4.0 kVAC / < 5 mA	2.0 kVAC / < 3 mA
Insulation / withstand voltage (output / GND)	1.25 kVAC / < 5 mA	0.5 kVAC / < 5 mA	0.5 kVAC / < 3 mA
Insulation resistance	≥ 100 MΩ		
Overvoltage category	III		
Pollution degree	2		



Inputs

	25 W	35 W	50 W	75 W
Rated input voltage	100 VAC to 277 VAC			
Input voltage range	85 VAC to 305 VAC (305 VAC max.)	80 VAC to 305 VAC (305 VAC max.)		
	100 VDC to 430 VDC (430 VDC max.)			
AC current (max) 115 VAC 230 VAC	< 0.6 A < 0.34 A	< 0.8 A < 0.6 A	< 1.2 A < 0.8 A	< 2 A < 1 A
Frequency range	47 Hz to 63 Hz			
Inrush current 115 VAC 230 VAC	20 A 40 A	30 A 50 A	30 A 60 A	40 A 75 A
Standby power consumption	< 0.3 W	< 0.5 W		< 0.3 W

	150 W	200 W	350 W
Rated input voltage	100 VAC to 277 VAC	100 VAC to 120 VAC 200 VAC to 240 VAC	
Input voltage range	80 VAC to 305 VAC (305 VAC max.)	Low voltage - switch in position of 115: 90 VAC to 132 VAC (132 VAC max.) High voltage - switch in position of 230: 180 VAC to 264 VAC (264 VAC max.)	
	100 VDC to 430 VDC (430 VDC max.)	Switch in position of 230: 240 VDC to 370 VDC (370 VDC max.)	
AC current (max) 115 VAC 230 VAC	< 4 A < 2 A	< 5 A < 3 A	< 8 A < 4 A
Frequency range	47 Hz to 63 Hz		
Inrush current 115 VAC 230 VAC	30 A 60 A	< 80 A < 80 A	60 A 60 A
Standby power consumption	< 0.5 W	< 0.75 W	



▶ Outputs

	25 W	35 W	50 W	75 W
Output power 12 VDC 24 VDC	25.2 W 25.5 W	36 W 36 W	51 W 52.8 W	72 W 76.8 W
Voltage accuracy	±1 %			
Line regulation	±0.5 %			
Load regulation				
Minimum load	> 0 %			
Voltage regulation span 12 VDC 24 VDC	10.8 V to 13.2 V 22 V to 27.6 V	11.4 V to 13.8 V 22.8 V to 27.6 V		10.2 V to 13.8 V 21.6 V to 28.8 V
Rated output current 12 VDC 24 VDC	2.1 A 1.1 A	3 A 1.5 A	4.2 A 2.2 A	6 A 3.2 A
Ripple and noise 20 MHz bandwidth 12 VDC 24 VDC	< 100 mV < 100 mV	60 - 150 mV 100 - 150 mV	65 - 150 mV 80 - 150 mV	120 mV 150 mV
Hold up time 115 VAC 230 VAC	8 ms 60 ms	6 ms 35 ms	6 ms 30 ms	≥ 8 ms ≥ 55 ms
Mounting space	No requirement for the installation distance			
Series operation	Yes			
Parallel operation	No			
Power boost	No			

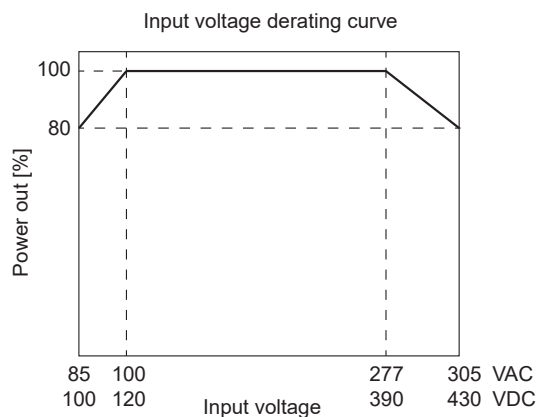
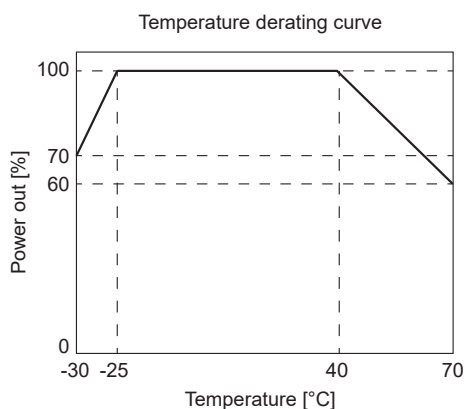
Outputs (continued)

	150 W	200 W	350 W
Output power 12 VDC 24 VDC	150 W 156 W	204 W 211.2 W	348 W 350.4 W
Voltage accuracy 12 VDC 24 VDC	±1 % ±1 %	±1.5 % ±1 %	
Line regulation	±0.5 %		
Load regulation 12 VDC 24 VDC	±0.5 % ±0.5 %	±1 % ±0.5 %	
Minimum load	> 0 %		
Voltage regulation span 12 VDC 24 VDC	11.4 V to 13.8 V 22.8 V to 27.6 V		
Rated output current 12 VDC 24 VDC	12.5 A 6.5 A	17 A 8.8 A	29 A 14.6 A
Ripple and noise 20 MHz bandwidth 12 VDC 24 VDC	≤ 150 mV ≤ 200 mV	150 mV 150 mV	180 mV 240 mV
Hold up time 115 VAC 230 VAC	8 ms 40 ms	≥ 8 ms ≥ 16 ms	12 ms 16 ms-
Mounting space	No requirement for the installation distance		
Series operation	Yes		
Parallel operation	No		
Power boost	No		

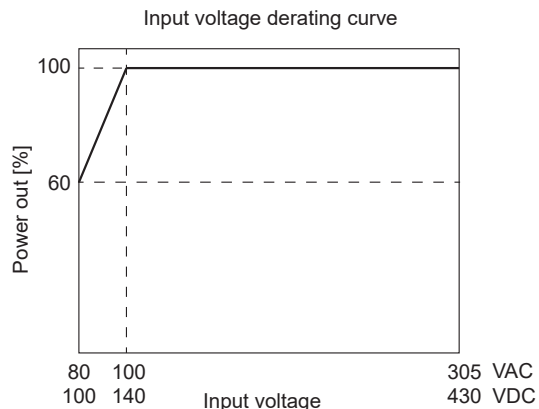
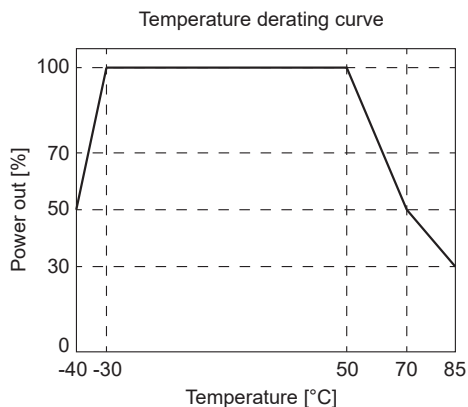
Performance

Current derating

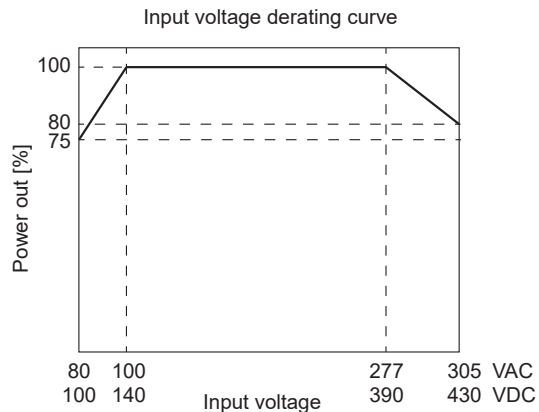
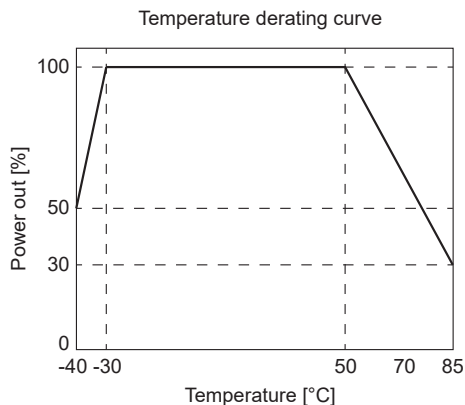
25 W



35 W

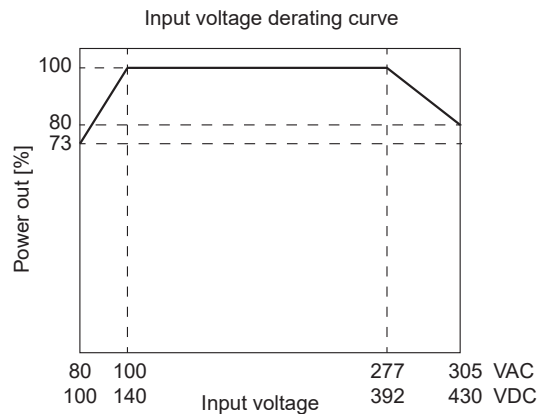
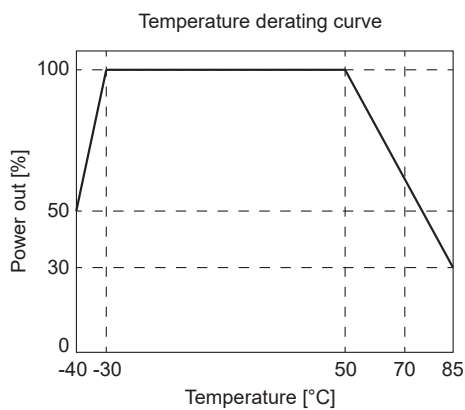


50 W

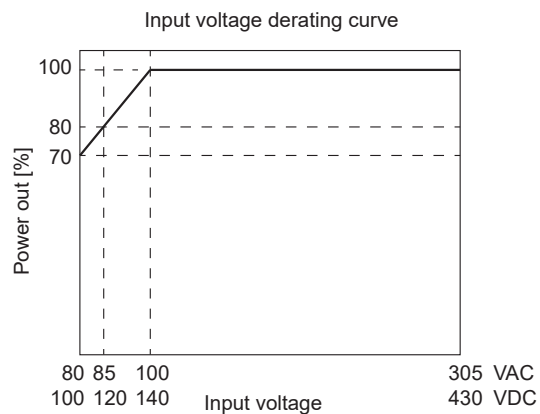
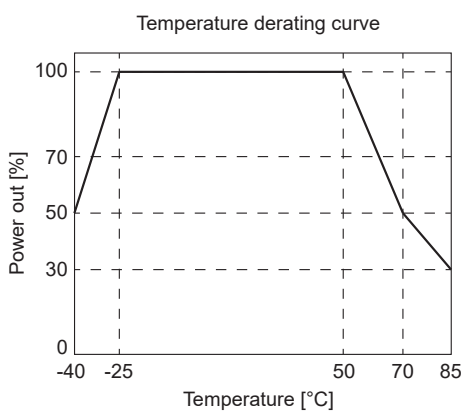


Current derating (continued)

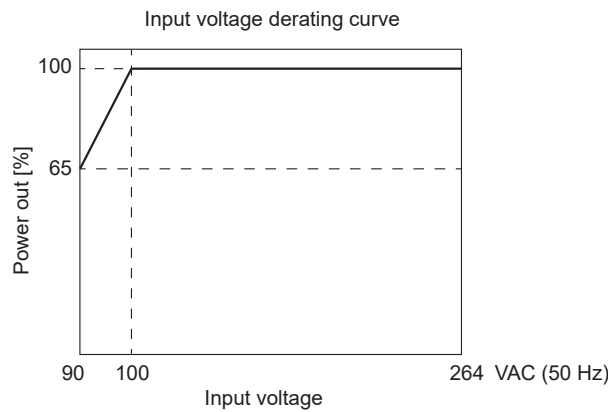
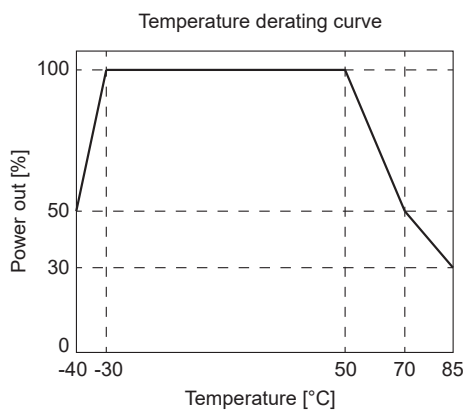
75 W



150 W

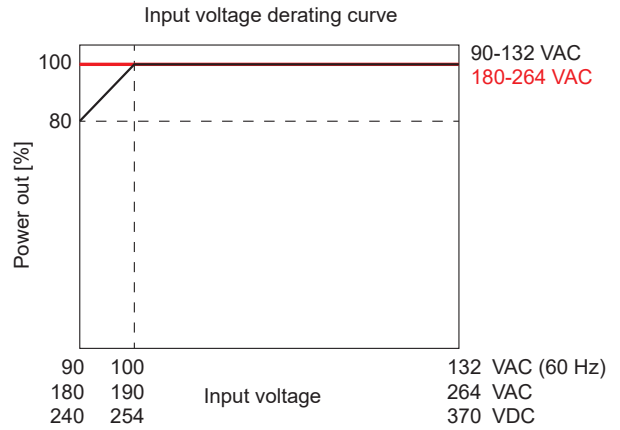
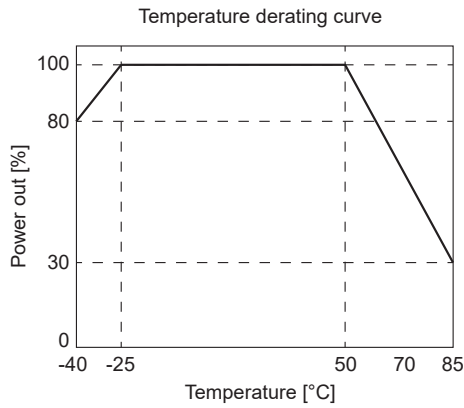


200 W



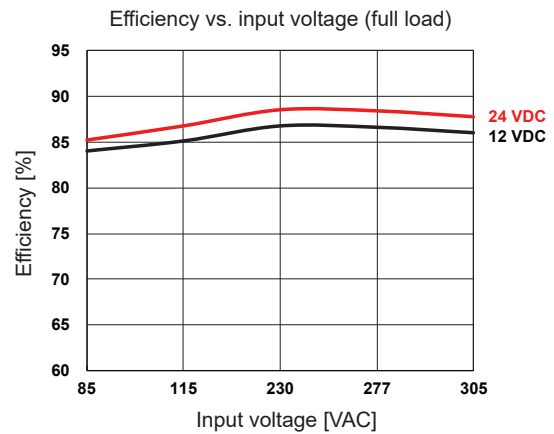
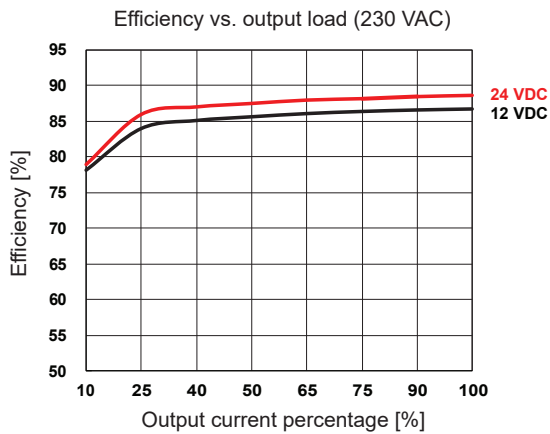
Current derating (continued)

350 W

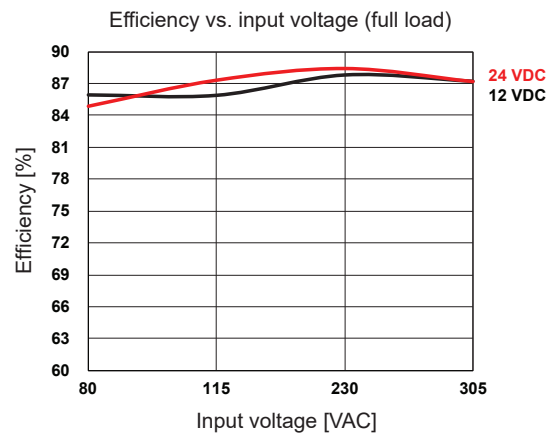
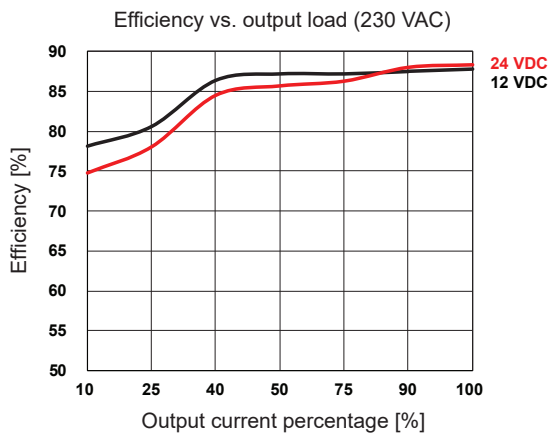


Efficiency

25 W

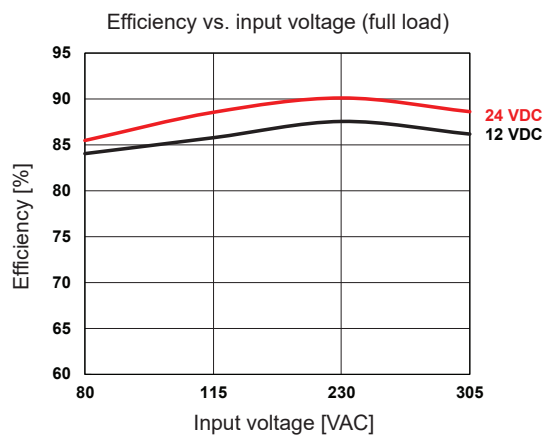
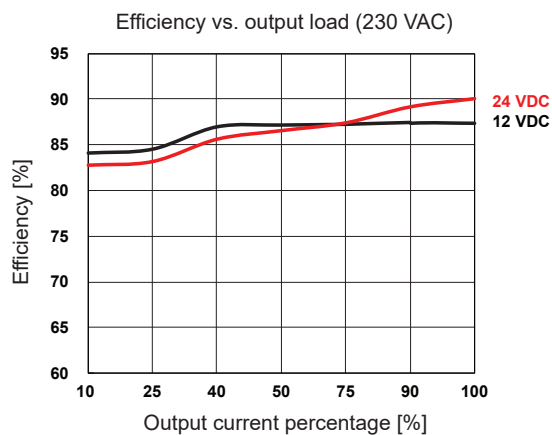


35 W

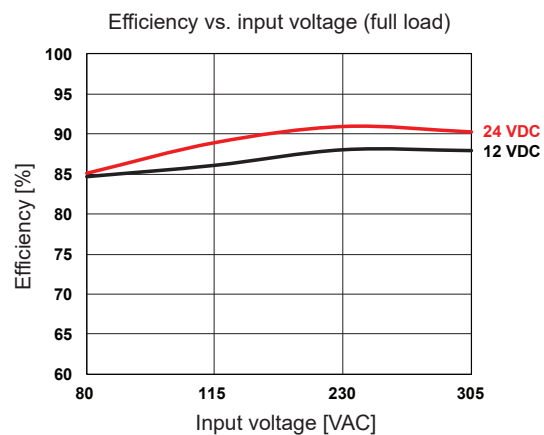
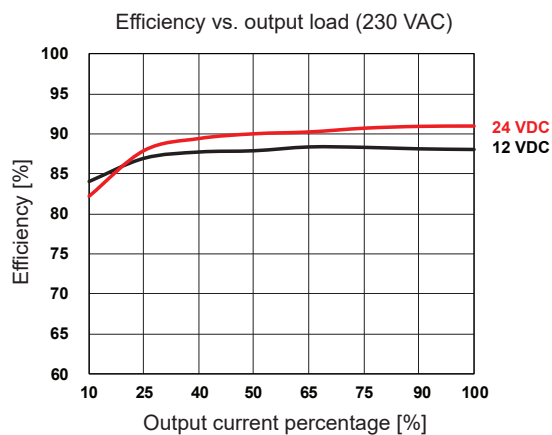


Efficiency (continued)

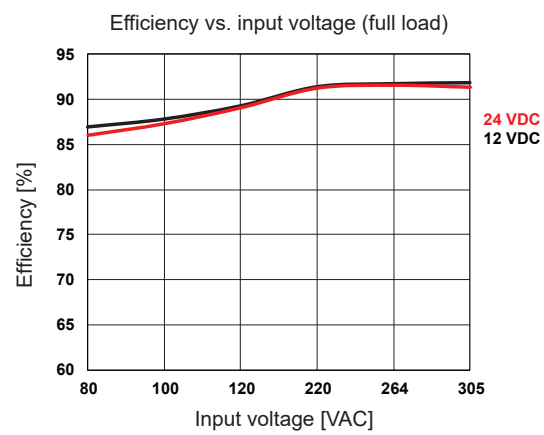
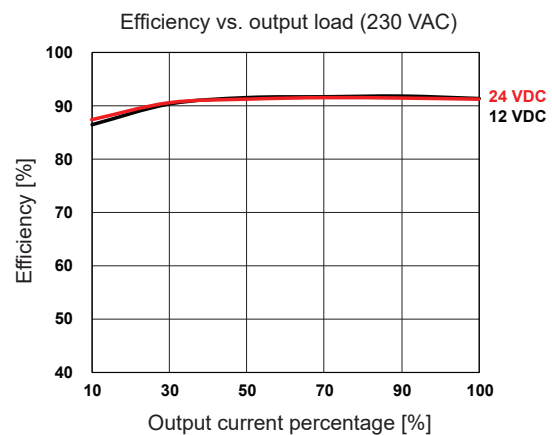
50 W



75 W

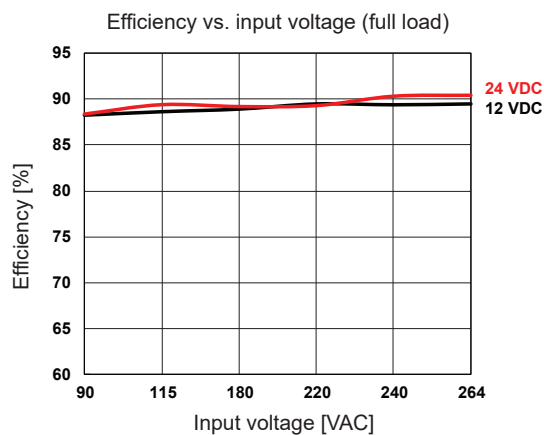
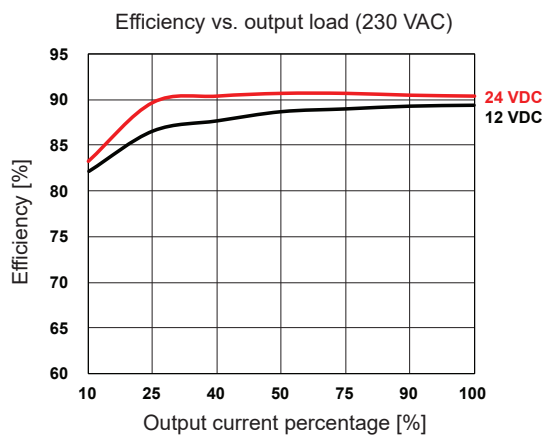


150 W

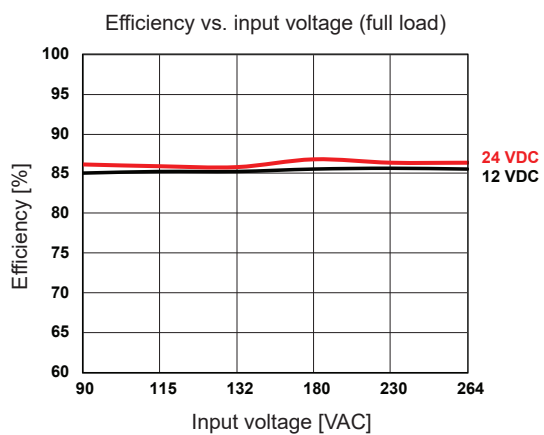
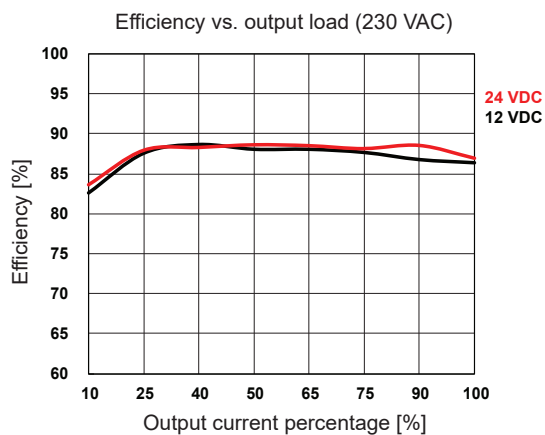


Efficiency (continued)

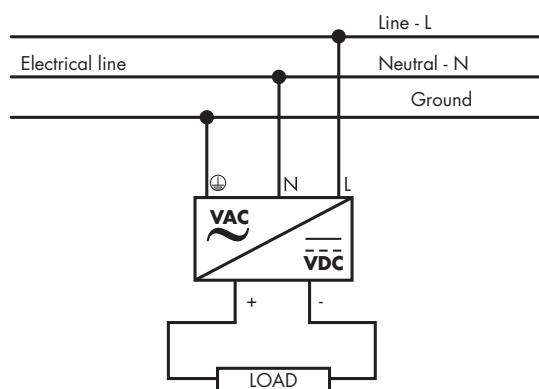
200 W



350 W



Wiring diagram



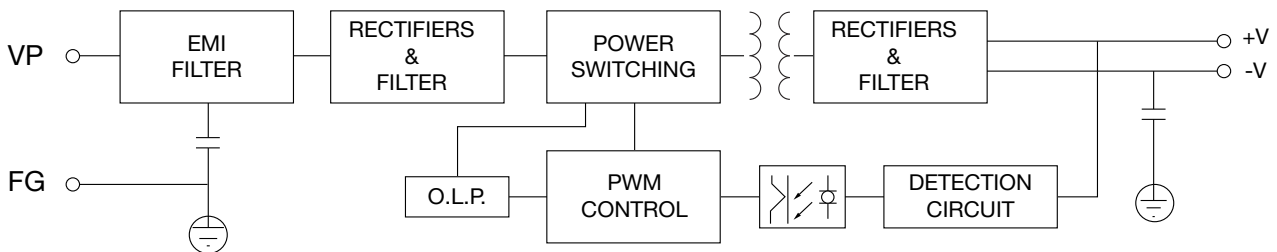
Connection specification

		25 W	35 W	50 W	75 W
Terminal type		Screw terminals with Phillips screw head			
Screw driver blade		3.5 mm slotted or Phillips			
Tightening torque (recommended)		0.4 Nm			
Conductor cross section (input terminals)					0.34 - 4 mm ² (22 - 12 AWG)
Conductor cross section (PE connection)		0.34 - 2.5 mm ² (22 - 14 AWG)			1.5 - 4 mm ² (16 - 12 AWG)-
Conductor cross section (output terminals)	12 VDC				0.75 - 4 mm ² (18 - 12 AWG)
	24 VDC				0.5 - 4 mm ² (20 - 12 AWG)

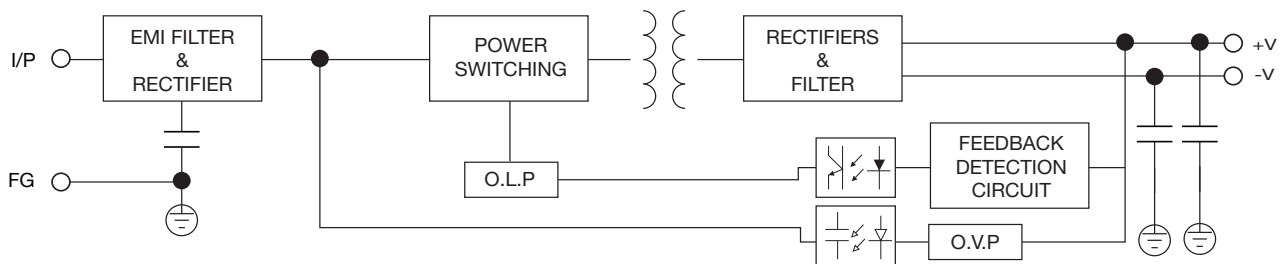
		150 W	200 W	350 W
Terminal type		Screw terminals with Phillips screw head		
Screw driver blade		3.5 mm slotted or Phillips		
Tightening torque (recommended)		0.4 Nm		
Conductor cross section (input terminals)		0.5 - 6 mm ² (20 - 10 AWG)		
Conductor cross section (PE connection)		1.5 - 6 mm ² (16 - 10 AWG)		
Conductor cross section (output terminals)	12 VDC	2.5 - 6 mm ² (14 - 10 AWG)	4 - 6 mm ² (12 - 10 AWG)	2.5 - 6 mm ² (14 - 10 AWG)
	24 VDC	0.75 - 6 mm ² (18 - 10 AWG)	1.5 - 6 mm ² (16 - 10 AWG)	0.75 - 6 mm ² (18 - 10 AWG)

Block diagram

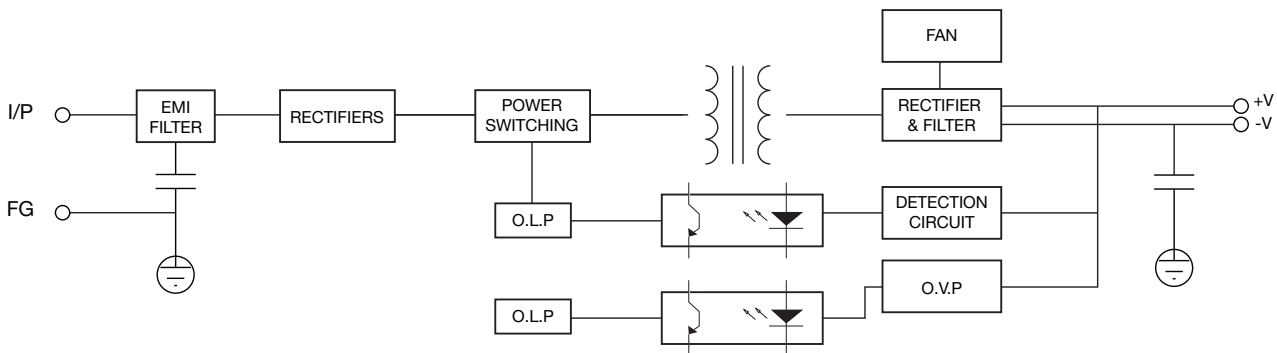
SPPE 25 W / 35 W / 50 W / 75 W



SPPE 150 W



SPPE 200 W / 350 W



Operating description

Control and protection

		25 W	35 W	50 W	75 W
Overvoltage protection	12 VDC	≤ 16.2 VDC Hiccup, self-recovery	≤ 16.2 VDC Hiccup or clamp, self-recovery		≤ 16 VDC Clamp, self-recovery
	24 VDC	≤ 32.4 VDC Hiccup, self-recovery	≤ 33.6 VDC Hiccup or clamp, self-recovery		≤ 33.6 VDC Hiccup, self-recovery
Overcurrent protection		110-300% I _o , self-recovery	120% - 200% I _o , hiccup, self-recovery		
Short circuit protection		Hiccup, continuous, self-recovery			
		Recovery time < 5 s, after the short circuit disappear	Recovery time < 3 s, after the short circuit disappear		Recovery time < 5 s, after the short circuit disappear
Overtemperature protection		-			

		150 W	200 W	350 W
Overvoltage protection	12 VDC	≤ 16 VDC Hiccup or clamp, self-recovery	≤ 16.2 VDC Hiccup or clamp, self-recovery after fault elimination	≤ 16.2 VDC Hiccup, self-recovery
	24 VDC	≤ 33.6 VDC Hiccup or clamp, self-recovery	≤ 33.6 VDC Hiccup or clamp, self-recovery after fault elimination	≤ 33.6 VDC Hiccup or clamp, self-recovery
Overcurrent protection		120% - 200% I _o , hiccup, self-recovery	120% - 250% I _o , hiccup, self-recovery after fault elimination	130-220% I _o , self-recovery
Short circuit protection		Hiccup, continuous, self-recovery		
		-	Recovery time < 5 s, after the short circuit disappear	-
Overtemperature protection		Output voltage turn off, self- recovery	Output voltage turn off, self-recovery after fault elimination	Hiccup, self-recovery