

## W Series

## 125 and 250 Watt AC-DC Converters



Input range 85...264 V AC with PFC  
1 or 2 isolated, regulated outputs up to 96 V  
3 kV AC I/O electric strength test voltage



- Electrically and mechanically rugged DIN-rail front end
- Outputs individually controlled with 150% output peak power
- Operating ambient temperature range  $-40...60^{\circ}\text{C}$  with convection cooling

### Selection chart for front ends

Output 1		Output 2		Input voltage $U_{i \min}$ $U_{i \max}$	Rated power $T_A = 60^{\circ}\text{C}$ $P_{o \text{ tot}}$ [W]	Type	Options <sup>1</sup>
$U_{o \text{ nom}}$ [V DC]	$I_{o \text{ nom}}$ [A]	$U_{o \text{ nom}}$ [V DC]	$I_{o \text{ nom}}$ [A]				
24.7	5	-	-	85...264 VAC (14...440 Hz) <sup>3</sup> 90...350 VDC	125	LWR-1601-6	R D1...D5
24.7	10	-	-		250	LWN-1601-6	
37	3.3	-	-		125	LWR 1701-6	S M2
37	6.6	-	-		250	LWN 1701-6	
49.4	2.6	-	-		125	LWR 1801-6	F, F1 K2
49.4	5	-	-		250	LWN-1801-6	
24.7	5	24.7	5		250	LWN-2660-6	
49.4	2.5	49.4	2.5		250	LWN 2880-6	

### Selection chart for battery chargers

Output		Input voltage $U_{i \min}$ $U_{i \max}$	Rated power $T_A = 60^{\circ}\text{C}$ $P_{o \text{ tot}}$ [W]	Type	Options <sup>1</sup>
$U_{o \text{ nom}}$ [V DC]	$I_{o \text{ nom}}$ [A]				
25.7...29.3	4.2	85...264 VAC (14...440 Hz) <sup>3</sup>	115	LWR 1240-6 M1	F, F1 K2
25.7...29.3	8.45		230	LWN 1240-6 M1	
51.4...58.6	2.1	90...350 VDC	115	LWR 1740-6 M1	
51.4...58.6	4.2		230	LWN 1740-6 M1	

<sup>1</sup> For lead times and minimum order quantity contact Power-One.

<sup>2</sup> For availability contact Power-One.

<sup>3</sup> Input frequency range certified for 14...440 Hz. For continuous operating frequency <40 Hz and >100 Hz contact factory.

## Input

Input voltage	world wide mains, single phase derating information see application note	85...264 V AC 90...350 V DC
Input frequency		14...440 Hz
Power factor	active PFC	up to 0.99
Inrush current	virtually no inrush current	

## Output

Efficiency	$U_{i\text{ nom}}, I_{o\text{ nom}}$	up to 89%
Output voltage setting accuracy	$U_{i\text{ nom}}, I_{o\text{ nom}}$	$\pm 1.3\% U_{o\text{ nom}}$
Output voltage noise	IEC/EN 61204	typ. 50 mV
Output voltage ripple	sinusoidal output ripple at twice the line frequency	$\leq 1.2 V_{pp}$
Line and cross regulation	$U_{i\text{ min}}...U_{i\text{ max}}$	typ. 50 mV
Load regulation	0...100% $I_{o\text{ nom}}, U_{i\text{ nom}}$	$-1.6\% U_{o\text{ nom}}$
Minimum load	not required	
Current limitation	rectangular U/I characteristic	101...112% $I_{o\text{ nom}}$
Short term peak power	1 s, electronically controlled	150% $I_{o\text{ nom}}$
Operation in parallel	enabled by droop current share	
Hold-up time	$I_{o\text{ nom}}, U_o$ decreases to 80% of $U_{o\text{ nom}}$	typ. 15 ms

## Control

Status indication	LED output(s) OK
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## Protection

Input fuse	not user accessible 6.3 A, slow blow	
Input reverse polarity	bridge rectifier	
Input undervoltage lockout	typ. 80% $U_{i\text{ min}}$	
Input overvoltage lockout	typ. 105% $U_{i\text{ max}}$	
Input transient protection	voltage depending resistor (VDR)	
Output(s)	no-load, overload and short circuit proof	
Output overvoltage	second control loop, each output, 24 V/48 V	30/60 V SELV
Overtemperature	reduced output power if thermally overloaded	

## Safety

Approvals	EN 60950, UL 1950, CSA22.2 No. 950, UL 508 listed	
Electric strength test voltage	class I, I/case	2 kV AC
	class I, I/O	3 kV AC
	class I, O/case	1 kV AC
	class I, O/O	0.35 kV AC
Pollution degree	AC-in / DC-in	3/2
Degree of protection		IP 20

**EMC**

Electrostatic discharge	IEC/EN 61000-4-2, level 4, contact/air (8/15 kV)	criterion A
Electromagnetic field	IEC/EN 61000-4-3, level 3 (10 V/m)	criterion A
Electr. fast transients/bursts	IEC/EN 61000-4-4, level 4, capacitive/direct (4/2 kV)	criterion A
Surge	IEC/EN 61000-4-5, level 3, in and out, line to line (2 kV)	criterion B
	level >3, input, line to case (3.5 kV)	criterion B
Conducted disturbances	level 2, output, line to case (1 kV)	criterion A
	IEC/EN 61000-4-6, level 3 (10 V)	criterion A
Electromagnetic emissions	CISPR 22/EN 55022, conducted	class A

**Environmental**

Operating ambient temperature	$U_{i\text{ nom}}, I_{o\text{ nom}}$ , convection cooled	-40...60°C
Operating case temperature $T_C$	$U_{i\text{ nom}}, I_{o\text{ nom}}$	-40...87°C
Storage temperature	non operational	-40...100°C
Damp heat	IEC/EN 60068-2-3, 93%, 40°C	56 days
Shock and vibration	unit wall mounted with brackets	
Shock	IEC/EN 60068-2-27, 11 ms	50 g <sub>n</sub>
Bump	IEC/EN 60068-2-29, 11 ms	25 g <sub>n</sub>
Vibration, sinusoidal	IEC/EN 60068-2-6, 10...60/60...2000 Hz	0.35 mm/5 g <sub>n</sub>
Vibration, random	IEC/EN 60068-2-64, 20...500 Hz	0.05 g <sup>2</sup> /Hz
MTBF	MIL-HDBK-217E, G <sub>B</sub> , 40°C	>600'000 h

**Options**

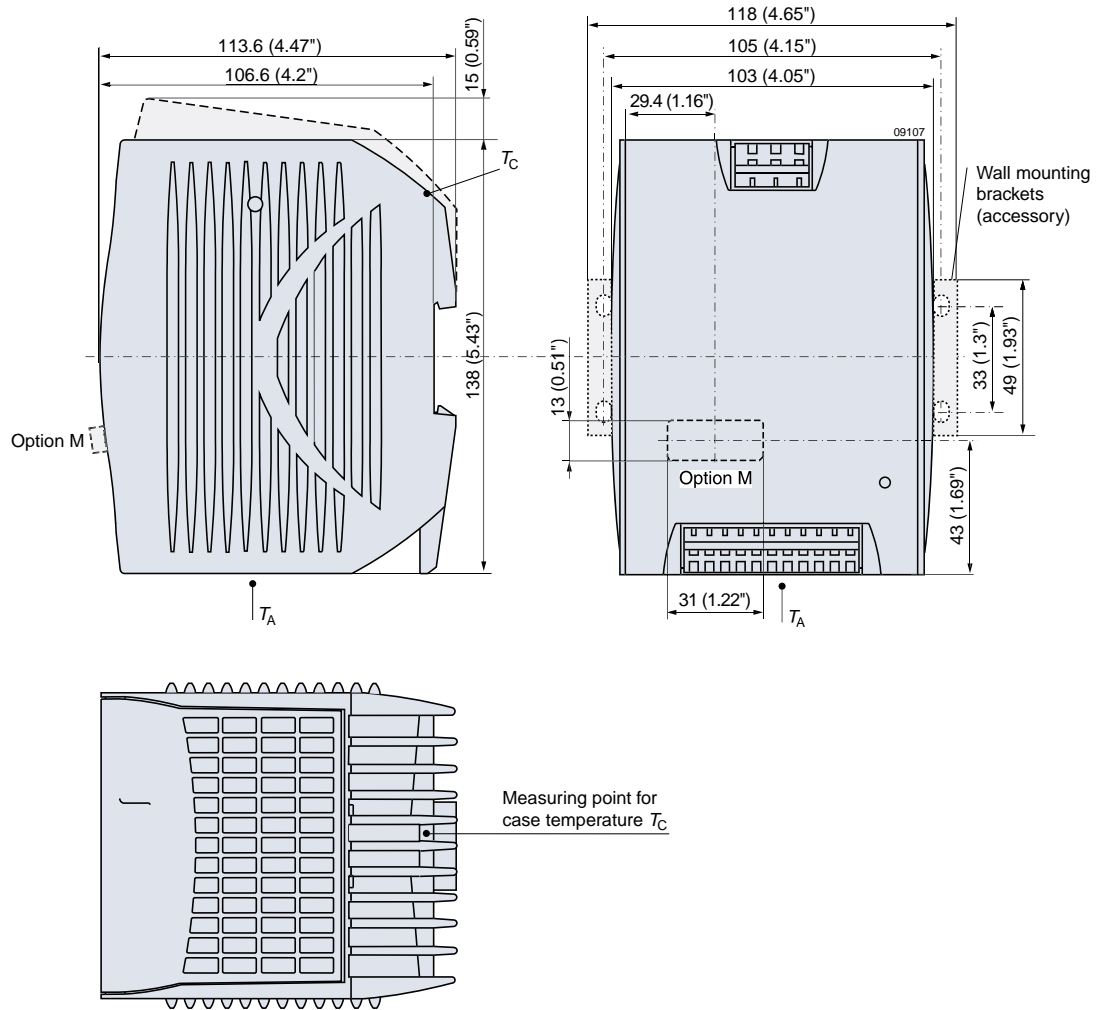
Input and output undervoltage monitoring		D1...D5
Output voltage adjustment	10 V...110% of $U_{o\text{ nom}}$	R
Remote on/off		S
Multi option choice (D1...D5, R, S) via Sub-D connector		M1...M2
Built-in second input fuse in the neutral		F
No fuse fitted (for operation from high DC)		F1
System connectors with screw terminals		K2

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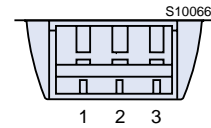
## Mechanical data

Tolerances  $\pm 0.3$  mm (0.012") unless otherwise indicated.



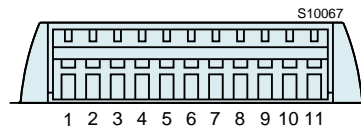
**Terminal allocation input side**

Pin	Des.	Determination
1	⊕	Protective earth
2	N $\sim$	Input neutral
3	P $\sim$	Input phase



**Terminal allocation output side**

Pin	Des.	Single output	Double output
1	⊕	Earth to load	Earth to load
2	+	Output pos.	Output 1 pos.
3	+	Output pos.	Output 1 pos.
4	-	Output neg.	Output 1 neg.
5	-	Output neg.	Output 1 neg.
6	+	Output pos.	Output 2 pos.
7	+	Output pos.	Output 2 pos.
8	-	Output neg.	Output 2 neg.
9	-	Output neg.	Output 2 neg.
10	Aux.	Options	Options
11	⊕	Earth to load	Earth to load



**Accessories**

- Mounting brackets for vertical chassis/wall mounting
- Fixing brackets for enhanced vibrations on DIN-rail
- Protective covers over input and output terminals