LEN120 Series

120 W AC-DC DIN Rail Switching Power Supply

Not Recommended for New Design

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LEN120 Series is Bel Power Solutions AC-DC converter series featuring a cost-effective, energy efficient green power supply solution for standard DIN-rail mounting. The products offer a high level of stability and immunity to noise for industrial control equipment, machinery, and other industrial equipment in a variety of harsh environments.

These light weight AC-DC converters have an extremely compact design and the standard rail (35 mm) installation for space saving. The product series provides a good EMC performance and is compliant with international safety standards UL 61010-1, EN/BS EN 62368-1.

FEATURES

- Input voltage 90 - 264 VAC (universal)
- Output voltage 12 V, 24 V, 48 V (adjustable)
- Operating ambient temperature range -20°C to +60°C
- High I/O isolation test voltage up to 4000 VAC
- Low ripple & noise
- Output short circuit, over-current, over-voltage, over-temperature protection
- DIN rail TS-35/7.5 or 15 mountable
- Ultra slim design with 36 mm width suitable for small chassis and narrow space installation
- UL 61010-1 safety certified
- Dimensions 36 x 125 x 100 mm (1.42 x 4.92 x 3.94 in)

APPLICATIONS

- Industrial control equipment
- Machinery
- Harsh environment applications

Please read our datasheet & drawing disclaimer here.

1. MODEL SELENTION

MODEL	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE	MAX OUTPUT CURRENT	EFFICIENCY [1]	MAX. CAPACITIVE LOAD	MAX OUTPUT POWER [2]
LEN120-12	90 - 264 VAC	12 V	10 A	85 %	3000 µF	120 W
LEN120-24	90 - 264 VAC	24 V	5 A	88 %	1200 µF	120 W
LEN120-48	90 - 264 VAC	48 V	2.5 A	89 %	800 µF	120 W

[1] Typical, at 230 VAC input
[2] See DERATING CURVES on page 4

2. INPUT SPECIFICATIONS

All specifications are measured at Ta = 25°C, humidity <75 % nominal input voltage and rated output load unless otherwise specified.

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Input voltage	AC Input	90		264	VAC
Input frequency		47		63	Hz
Input current	115 VAC 230 VAC			2.7 1.6	A
Inrush current [3]	115 VAC 230 VAC		30 55		A
Leakage current	240 VAC			1	mA

[3] Cold start

3. OUTPUT SPECIFICATIONS

All specifications are measured at Ta = 25°C, humidity <75 % nominal input voltage and rated output load unless otherwise specified.

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Adjustable output voltage [4]	LEN120-12 LEN120-24 LEN120-48	12 24 48		14 28 55	VDC
Output current	LEN120-12 LEN120-24 LEN120-48			10 5 2.5	A
Output voltage accuracy [5]	LEN120-12 LEN120-24 / LEN120-48		± 2 ± 1		%
Line regulation	Rated load		± 0.5		%
Load regulation	0% - 100% load		± 1		%
Ripple & noise [6]	LEN120-12 LEN120-24 LEN120-48			100 120 150	mVpp
Temperature coefficient			± 0.03		%/°C
Minimum load		0			%
Hold-up time	115 VAC 230 VAC	8 16			ms
Switching frequency			65		kHz

[4] The output voltage can be adjusted by the output adjustable resistance ADJ, turn clockwise
[5] At full load range
[6] Measured with 20 MHz bandwidth, output parallel 47 µF electrolytic capacitor and 0.1 µF ceramic capacitor

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4. PROTECTIONS

PARAMETER	DESCRIPTION / CONDITIONS		MIN	TYP	MAX	UNIT
Short circuit protection	Constant current up to 1s, after 1s Hiccup mode applied. Auto recovery. Recovery time < 3s after the SC disappear.					
Over current protection [7]	Normal / high temperature: auto recovery Low temperature: respecting derating rules in Fig. 1, auto recovery		105 105		150	% Io
Over voltage protection	Vout latch off (restart required)	LEN120-12 LEN120-24 LEN120-48			16 33 60	V
Over temperature protection	OTP start OTP release (Restart required)		 60		90	°C

[7] *Constant current up to 1s, after 1s Hiccup mode applied.*

5. ENVIRONMENTAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS		MIN	TYP	MAX	UNIT
Operating temperature			-20		+60	°C
Storage temperature			-40		+85	°C
Temperature derating	All series	-20°C to -10°C (115 VAC) -20°C to -10°C (230 VAC) +40°C to +60°C (115 VAC)	2 0 2.5			%/°C
	LEN120-12 LEN120-24 / LEN120-48	+45°C to +60°C (230 VAC) +50°C to +60°C (230 VAC)	3.33 5			
Input voltage derating	AC Input voltage between 90 - 115 VAC / 27 - 162 VDC		1.0			%/VAC
Humidity	Operating, non-condescending Storage, non-condescending		20 10		90 95	%RH
MTBF	MIL-HDBK-217F @ 25 °C		300 000			hrs

6. EMC SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	CLASS / LEVEL / CRITERION
Conducted emissions	EN 55032 / CISPR 32	Class A
Radiated emissions	EN 55032 / CISPR 32	Class A
Harmonic current	IEC/EN 61000-3-2	Class A
ESD immunity	IEC/EN 61000-4-2, Contact ±6 kV / Air ±8 kV	Performance Criterion B
Radiated field immunity	IEC/EN 61000-4-3, 10 V/m	Performance Criterion A
Electrical fast transient	IEC/EN 61000-4-4, ± 4 kV	Performance Criterion B
Surge immunity	IEC/EN 61000-4-5, Line to line ±2 kV / Line to ground ±4 kV	Performance Criterion B
Conducted immunity	IEC/EN 61000-4-6, 10 V_{RMS}	Performance Criterion A
Voltage dips, interruptions	IEC/EN 61000-4-11, 0%, 70%	Performance Criterion B

7. SAFETY SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Safety standards & approvals	UL 61010-1, UL 61010-2-201 safety certified				
Safety class	Class I				
Isolation test [8]	Input to Ground Input to Output Output to Ground	2000 4000 500			VAC
Insulation resistance	At 500 VDC	100			MΩ

[8] *Electric strength test for 1 min., leakage current <10 mA*

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8. MECHANICAL SPECIFICATIONS

PARAMETER	DESCRIPTION / CONDITIONS	MIN	TYP	MAX	UNIT
Dimensions			36 x 125 x 100 1.42 x 4.92 x 3.94		mm in
Weight			410		g
Case [9]	Material: Metal (AL1100, SGCC)				
Cooling	Convection (Natural air flow)				

[9] *When the power supply is in use, the enclosure of the product needs to be connected to the system grounding.*

9. DERATING CURVES

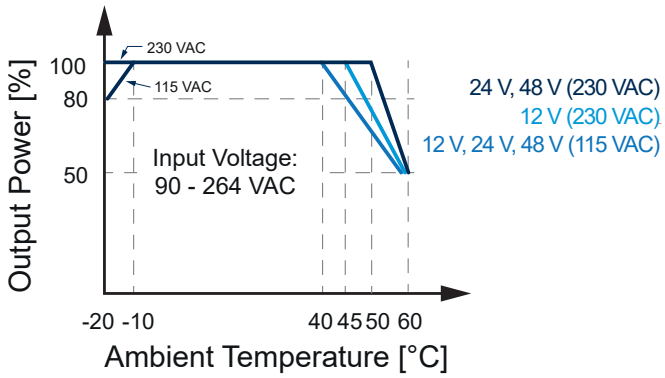


Figure 1. Temperature Derating Curve

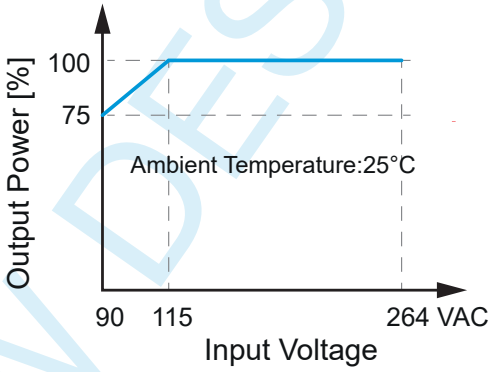


Figure 2. Input Voltage Derating Curve

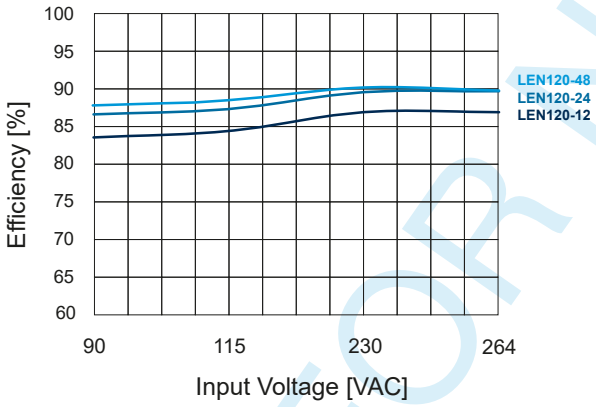


Figure 3. Efficiency vs Input Voltage Derating Curve (Full Load)

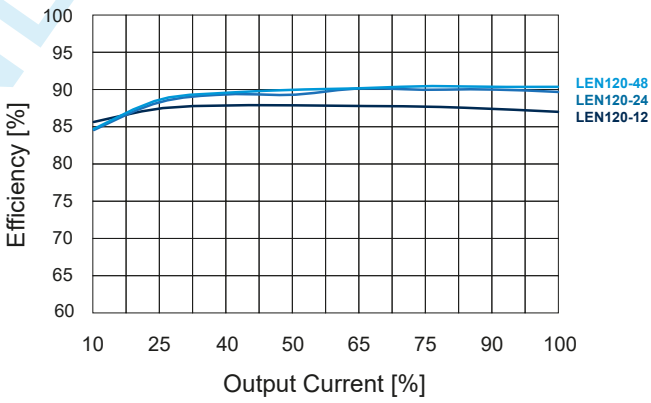
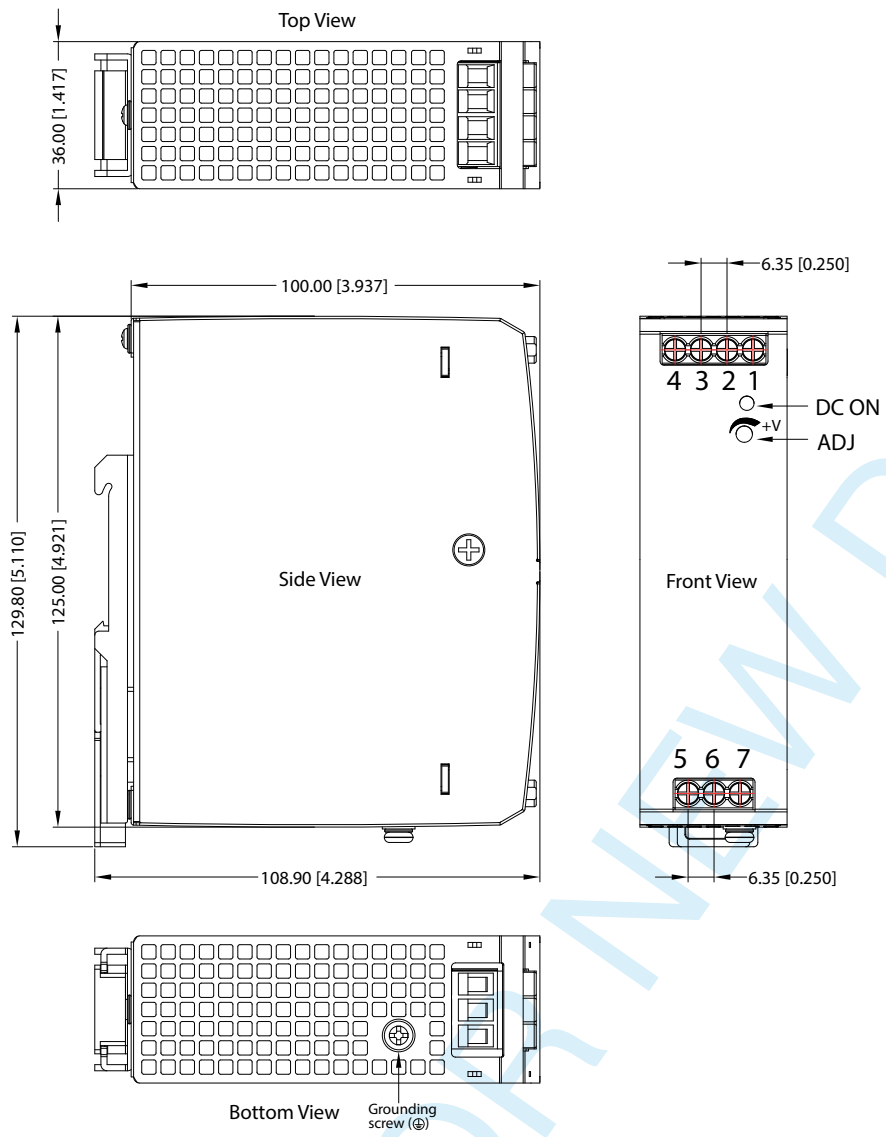


Figure 4. Efficiency vs Output Load Derating Curve (Vi = 230 VAC)

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10. MECHANICAL DRAWINGS



All dimensions are in mm [in]
General tolerance ±1.00 mm [±0.039 in]
Wire range 26-10 AWG
Tightening torque max. 0.4 Nm
Mounting DIN Rail TS35
(rail needs to be connected to safety ground)

	PIN	FUNCTION
OUTPUT TERMINAL	1	-Vo
	2	-Vo
	3	+Vo
	4	+Vo
INPUT TERMINAL	5	AC (N)
	6	AC (L)
	7 *	⏚
GROUNDING SCREW *		⏚
ADJ		Output adjustable resistor
DC OK SIGNAL		Monitors the output voltage on the output terminals

** Pin 7 and the grounding screw are interconnected. Either Pin 7 or the grounding screw need to be connected to earth.*

Figure 5. Mechanical Drawing

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NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.

TECHNICAL REVISIONS - The appearance of products, including safety agency certifications pictured on labels, may change depending on the date manufactured. Specifications are subject to change without notice.

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