

INSTALLATION INSTRUCTION

LEC120 Series DIN Rail Power Supply



LEC120-12	INPUT: 100 – 240 VAC, 1.5 - 0.75 A, 50 - 60 Hz (UL certified) or 120 - 370 VDC, 1.5 – 0.75 A OUTPUT: 12 VDC, 10 A
LEC120-24	INPUT: 100 – 240 VAC, 1.5 - 0.75 A, 50 - 60 Hz (UL certified) or 120 - 370 VDC, 1.5 – 0.75 A OUTPUT: 24 VDC, 5 A
LEC120-48	INPUT: 100 – 240 VAC, 1.5 - 0.75 A, 50 - 60 Hz (UL certified) or 120 - 370 VDC, 1.5 – 0.75 A OUTPUT: 48 VDC, 2.5 A

READ THIS CAREFULLY BEFORE INSTALLATION!	VOR DER INSTALLATION BITTE FOLGENDE SICHERHEITSHINWEISE BEACHTEN!	LEGGERE ATTENTAMENTE PRIMA DELL'INSTALLAZIONE!	A LIRE ATTENTIVEMENT AVANT L'INSTALLATION!
Before operating, read this document thoroughly and retain it for future reference. Non-respect of these instructions may reduce performances and safety of the devices and cause danger for people and property	Lesen Sie dieses Dokument vor der Inbetriebnahme sorgfältig durch und bewahren Sie es zum späteren Nachschlagen auf. Die Nichtbeachtung dieser Anweisungen kann die Funktion und Sicherheit der Geräte beeinträchtigen und birgt Gefahren für Personen und Eigentum. Haftung für die Folgen, die sich aus dem Einsatz dieses Gerätes ergeben.	Prima dell'installazione, leggere attentamente questo documento istruzioni e conservarlo per future consultazioni. L'inosservanza delle presenti istruzioni può compromettere le caratteristiche e la sicurezza dell'apparecchio e causare pericolo per le persone e le cose.	Lire ces instructions avant l'installation, conservez ce manuel pour référence future. Défaut de se conformer à ces instructions peut affecter les caractéristiques et la sécurité du dispositif, et causer du danger aux personnes ou aux biens
CAUTION	ACHTUNG	ATTENZIONE	AVERTISSEMENT
<p>RISK OF BURNS, EXPLOSION, FIRE, ELECTRICAL SHOCK, PERSONAL INJURY.</p> <ol style="list-style-type: none"> Do not use this power supply without proper grounding (protective grounding), use the wiring terminals on the input components instead of the screws on the shell for grounding; Before performing operations on the equipment, turn off the power supply to provide protection to avoid accidentally re-energizing; Comply with all local and national regulations to ensure correct wiring; Do not modify or repair this product; Do not open the unit as high voltages are present inside; Take care to prevent any foreign matter from entering the shell; Do not use this product in humid places or areas where moisture or condensation may occur; When the power is turned on and just after it is turned off, do not touch it. The hot surface may cause burns; 	<p>Gefahr von Stromschlag, Feuer, Körperverletzung oder Tod:</p> <ol style="list-style-type: none"> Verwenden Sie dieses Netzteil nicht ohne ordnungsgemäße Erdung (Schutzerdung). Verwenden Sie zur Erdung die Anschlussklemmen an den Eingangskomponenten anstelle der Schrauben am Gehäuse; Schalten Sie vor dem Ausführen von Arbeiten am Gerät die Stromversorgung aus, um ein versehentliches Wiedereinschalten zu vermeiden. Beachten Sie alle lokalen und nationalen Vorschriften, um eine korrekte Verdrahtung zu gewährleisten; Modifizieren oder reparieren Sie dieses Produkt nicht; Öffnen Sie das Gerät nicht, da im Inneren hohe Spannungen anliegen; Achten Sie darauf, dass keine Fremdkörper in die Schale gelangen; Verwenden Sie dieses Produkt nicht an feuchten Orten oder in Bereichen, in denen Feuchtigkeit oder Kondensation auftreten kann; Berühren Sie das Gerät beim Einschalten und kurz nach dem Ausschalten nicht, da die heiße Oberfläche Verbrennungen verursachen kann. 	<p>Rischio di scosse elettriche, incendi, lesioni personali o morte:</p> <ol style="list-style-type: none"> Non utilizzare questo alimentatore senza un'adeguata messa a terra (messa a terra di protezione), utilizzare i terminali di cablaggio sui componenti di ingresso invece delle viti sul guscio per la messa a terra; Prima di eseguire operazioni sull'apparecchiatura, togliere l'alimentazione per fornire protezione per evitare la riaccensione accidentale; Osservare tutte le normative locali e nazionali per garantire un cablaggio corretto; Non modificare o riparare questo prodotto; Non aprire il dispositivo poiché all'interno sono presenti alte tensioni Fare attenzione ad evitare che corpi estranei entrino nel guscio; Non utilizzare questo prodotto in luoghi umidi o aree in cui potrebbe verificarsi umidità o condensa; Quando l'apparecchio è acceso e subito dopo averlo spento, non toccarlo. La superficie calda può causare ustioni. 	<p>Risque de choc électrique, d'incendie, de blessures corporelles ou de décès:</p> <ol style="list-style-type: none"> N'utilisez pas cette alimentation sans mise à la terre appropriée (mise à la terre de protection), utilisez les bornes de câblage sur les composants d'entrée au lieu des vis sur la coque pour la mise à la terre ; Avant d'effectuer des opérations sur l'équipement, coupez l'alimentation électrique pour assurer une protection afin d'éviter une remise sous tension accidentelle ; Respectez toutes les réglementations locales et nationales pour garantir un câblage correct ; Ne modifiez ni ne réparez ce produit ; N'ouvrez pas l'appareil car il y a de hautes tensions à l'intérieur Prendre soin d'éviter que des corps étrangers ne pénètrent dans la coque ; N'utilisez pas ce produit dans des endroits humides ou des zones où de l'humidité ou de la condensation peuvent se produire ; Lorsque l'appareil est allumé et juste après l'avoir éteint, ne le touchez pas. La surface chaude peut provoquer des brûlures.
INTENDED USE	BESTIMMUNGSGEMÄßER BETRIEB	USO PREVISTO	UTILISATION
These are designed to be mounted on DIN rails and installed in protective enclosures. They are suitable for general purposes, such as industrial control, communications, and instrumentation equipment. Do not use these devices in applications where malfunctions may cause personal injury or death.	Diese sind für die Montage auf DIN-Schienen und den Einbau in Schutzgehäuse vorgesehen. Sie eignen sich für allgemeine Zwecke, wie z. B. industrielle Steuerungs-, Kommunikations- und Instrumentierungsausrüstung. Verwenden Sie diese Geräte nicht in Anwendungen, bei denen Fehlfunktionen zu Verletzungen oder zum Tod führen können.	Questi sono progettati per essere montati su guide DIN e installati in custodie protettive. Sono adatti per scopi generali, come controllo industriale, comunicazioni e apparecchiature di strumentazione. Non utilizzare questi dispositivi in applicazioni in cui malfunzionamenti possono causare lesioni personali o morte.	Ceux-ci sont conçus pour être montés sur des rails DIN et installés dans des boîtiers de protection. Ils conviennent à des usages généraux, tels que les équipements de contrôle industriel, de communication et d'instrumentation. N'utilisez pas ces appareils dans des applications où des dysfonctionnements peuvent causer des blessures ou la mort.
ENVIRONMENTAL CHARACTERISTICS	UMGEBUNGSBEDINGUNGEN	CARATTERISTICHE AMBIENTALI	CARACTÉRISTIQUES ENVIRONNEMENTALES
Installation in a Pollution Degree 2 environment. Do not use in wet area or subject to moisture. Carefully recycle the product and related batteries according to local regulations.	Installation in einer Umgebung mit Verschmutzungsgrad 2. Nicht in nassen Bereichen oder unter Feuchtigkeit verwenden. Das Gerät und die zugehörigen Batterien sind entsprechend den lokalen Vorschriften zu recyceln bzw. zu entsorgen.	Usare in ambienti con Grado di Inquinamento 2. Non far funzionare l'apparecchio in un ambiente umido o soggetto a formazione di condensa. Riciclare il prodotto e le batterie collegate, nel rispetto delle normative locali vigenti.	Utiliser les produits dans des environnements avec degré de pollution 2. Ne pas employer l'appareil dans un environnement humide ou soumis à la condensation. Recycler les produits et les batteries, conformément à la réglementation locale.

USER INSTRUCTIONS**1) DESCRIPTION**

DIN rail-mounted main switching power supply, with 85 - 264 VAC (120 - 370 VDC) input, suitable for single-phase power lines and DC lines.

2) INSTALLATION

Use DIN-rails according to EN 60715. Installation should be made vertically (see Fig. 4). For better device stability fix the rail to the wall close to the point where the device is to be mounted. In order to guarantee sufficient convection, we recommend observing a minimum distance to other modules (see Fig. 3).

The product has over-temperature protection; restricted airflow will cause local temperatures to be too high, which may trigger the over-temperature protection to restart after cooling;

To get normal operation reduce the temperature of the air surrounding the power supply, increase the ventilation or reduce the load (see Fig. 8)

3) CONNECTIONS

The device is equipped with screw terminal blocks. To avoid sparks, do not connect or disconnect the connectors before having previously turned-off input power and waited for internal capacitors discharge (minimum 1 minute)

In order to comply with UL certification,

When the ambient temperature is $\leq 60^{\circ}\text{C}$, use a copper wire with a specification of $\geq 90^{\circ}\text{C}$;

When the ambient temperature is $> 60^{\circ}\text{C}$ and $\leq 85^{\circ}\text{C}$, use a copper wire with a specification of $\geq 105^{\circ}\text{C}$;

Only use wires with a minimum insulation strength of 300 V (input) and 60 V (output).

4) INPUT PROTECTION

The device input is provided with varistors against overvoltage. Input is provided with internal fuses 4 AT / 250 VAC, thus an external short circuit / overcurrent protection must be provided by the end user (see Fig. 6).

For operation on a single-phase system, a protection fuse on the phase must be provided.

Surge protection: it is strongly recommended to provide external surge arresters (SPD) according to local regulations.

5) AC INPUT CONNECTION

The device can be connected to single phase AC line with rated V_{in} 100 - 240 VAC (see Fig. 7). Please connect the PE first.

6) DC INPUT CONNECTION

Connect L terminal to (+) positive pole, N terminal to (-) negative pole and PE terminal to GND. Rated voltage 120 - 370 VDC. The device is also suitable for photovoltaic or wind turbine applications (see Fig. 7).

7) OUTPUT CONNECTION

Vout can be adjusted with a potentiometer to a wide range (see Fig. 1)

Check Vout before connecting the power supply to the load. With output voltage set to the max. value, the continuous [current x voltage] must not exceed the nominal power.

8) OUTPUT PROTECTION

The device is protected against overload (OL) / short circuit (SC) / overvoltage (OV) / overtemperature (OT).

Overload (OL) enters hiccup mode 1:

When the output power is 105%~150% of the rated output power, the output voltage is the nominal voltage, and the output of the product will be turned off after keeping it constant for 3 seconds, and the output will restart after 10s, and the power will start to turn on/off Cycle hiccup mode until the abnormality is eliminated

Overload (OL) enters hiccup mode 2:

When the output power is 150%~200% of the rated output power, the output voltage begins to drop and remains constant. The output current depends on the value of the output load impedance; the output voltage remains constant and shuts down after working for 1 second. Cut off the output, the output will restart after 10 s, and the power will start on/off cycle hiccup mode until the abnormality is eliminated

Overload (OL) enters constant current (CC) hiccup mode:

When the output power is greater than 200% of the rated output power, the output voltage drops and depends on the value of the impedance of the faulty load circuit; the output current is kept constant for 1s and then the product output is turned off, after 10s The output restarts, and the power supply starts to start the on/off cycle hiccup mode until the abnormality is eliminated.

Short circuit (SC) enters constant current (CC) hiccup mode:

When the output load is short-circuited, the output voltage is close to 0V, the output current is constant, the device can provide $\geq 200\%$ of the rated output current, and the power supply keeps the output current constant for 1s and then shuts off the product output After 10 s, the output restarts, and then the device starts the on/off cycle hiccup mode until the abnormality is eliminated.

Output OV circuit protection:

The output is protected against potential OV. The protection phenomenon is that the output voltage is shut down, and the input restart is required to resume normal operation.

The overvoltage protection point depends on the product model,

12 V: overvoltage protection point ≤ 18 V;

24 V: overvoltage protection point ≤ 35 V;

48 V: overvoltage protection point ≤ 60 V

OT protection:

It turns off the device if the internal temperature exceeds a safe limit. The device restarts automatically after cooling down. To recover to normal operation, reduce air temperature surrounding the power supply, increase cooling or reduce load

9) FEEDING DC MOTORS

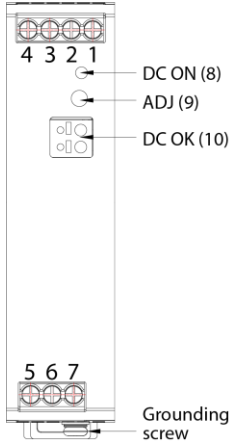
It is possible to feed DC motors considering that when a motor starts-up under effort its consumption is much higher than the nominal current and it can trigger overcurrent protection (see accessory device).

NOTE: motors can generate high conducted noise on the DC line. Therefore, it is not recommended to feed on the same line motors and equipment sensitive to noise.

10) OPERATION WITH BATTERY

When a battery is connected in parallel to the Output for backup purposes (see accessory device).

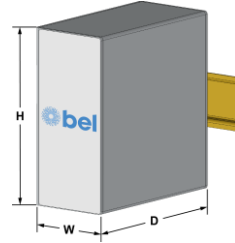
FIG. 1 - CONNECTIONS



PIN	FUNCTION
1	-Vo = Negative DC
2	-Vo = Negative DC
3	+Vo = Positive DC
4	+Vo = Positive DC
5	AC (N) = Neutral
6	AC (L) = Line
7*	⊕ = Earth ground
8	DC ON = Output OK (Green LED)
9	ADJ = Output voltage adjustment
10	DC OK SIGNAL = Vo on terminals

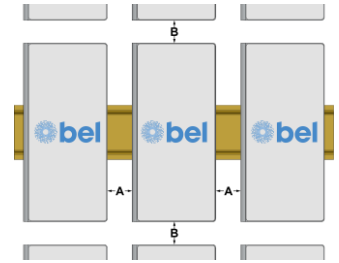
* Pin 7 and the grounding screw (at the bottom) are interconnected. Either Pin 7 or the grounding screw need to be connected to earth.

FIG. 2 - DIMENSIONS



Dimension	mm (in)
W	32 (1.26)
D	110 (4.331)
H	124 (4.882)

FIG. 3 - DISTANCES



Distance	mm (in)
A	15 (0.8)
B	50 (2.0)

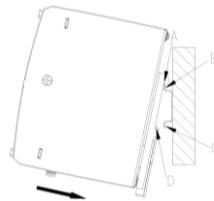
FIG. 4 - MOUNTING / DISMOUNTING INSTRUCTIONS

For DIN rail fastening according to IEC 60715 TH35-7.5(-15)

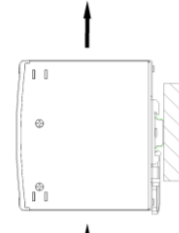
Mounting as shown in figure, with input terminals on lower side, with suitable cooling and maintaining a proper distance between adjacent devices as specified in the Installation Instruction of each family.

MOUNTING:

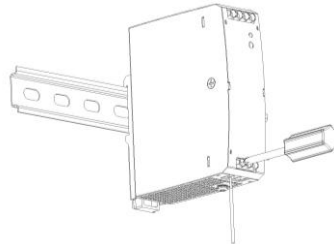
1. Set the top of the power supply (A) on the top of the DIN rail (B) to latch. Press the bottom of the power supply (D) against the rail to lock it in the position on the rail (C).
2. Correctly installed power supply (vertically).
3. Insert the copper wires into the top and bottom terminals and tighten them with a screwdriver.
4. Adjust the output voltage with a suitable tool according to adjustment range in the selection guide.



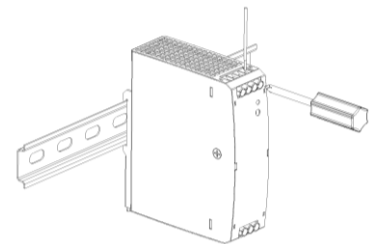
1



2



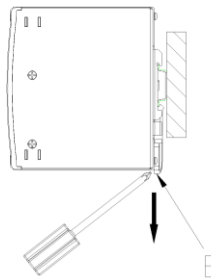
3



4

DISMOUNTING:

5. Insert the screwdriver into the slide clamp lever (E) and pull it down.
6. Tilt the power supply upwards to unhook it from the rail.



5



6



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FIG. 5 - RECOMMENDED CONNECTING CABLE

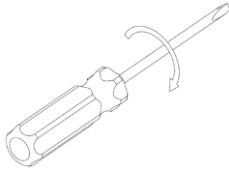

	<p>Recommended Tightening torque 0.79 ± 0.079 Nm</p>		<p>Wire range: Input: 26 – 10 AWG (12 – 10 AWG for Pin7) Output: 12 V: 16 – 10 AWG 24 V: 20 – 10 AWG 48 V: 22 – 10 AWG DC OK: 24 – 16 AWG</p>
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FIG. 6 - INPUT PROTECTION

Fuse MCB 4 A C curve.
For USA and Canada, use the fuse type closest to the European equivalent type.
Surge protection: it is strongly recommended to provide external surge arresters (SPD) according to local regulations.

FIG. 7 - INPUT CONNECTIONS

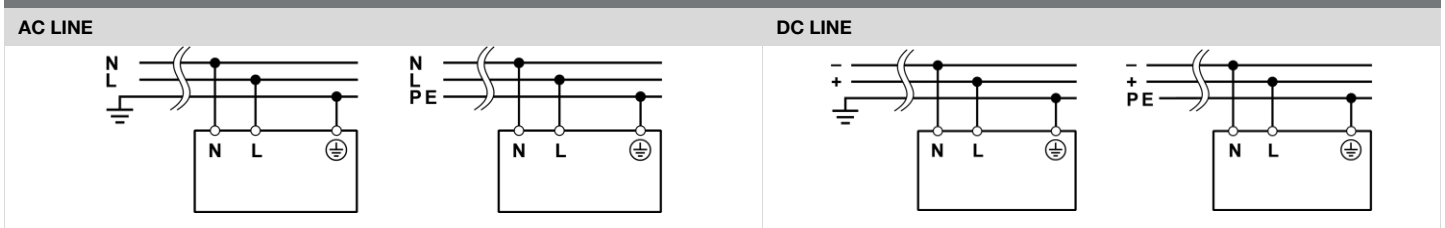
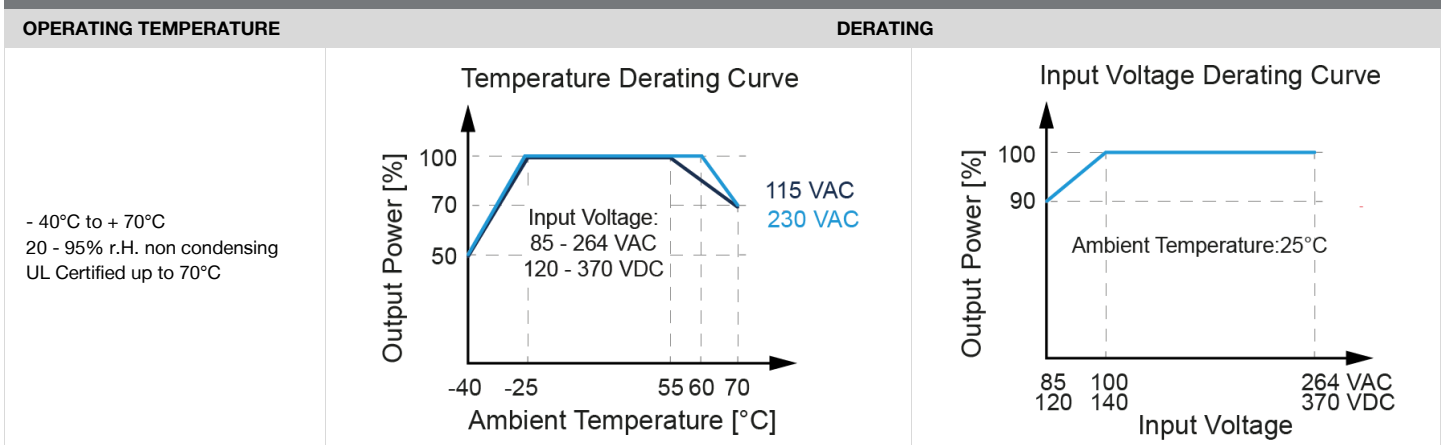


FIG. 8 - ENVIRONMENT



NOTES:

- Specifications are subject to change without prior notice.
- Please refer to the latest version of the [Datasheet](#) and [Installation Instruction](#) for each product by visiting belfuse.com/power-solutions