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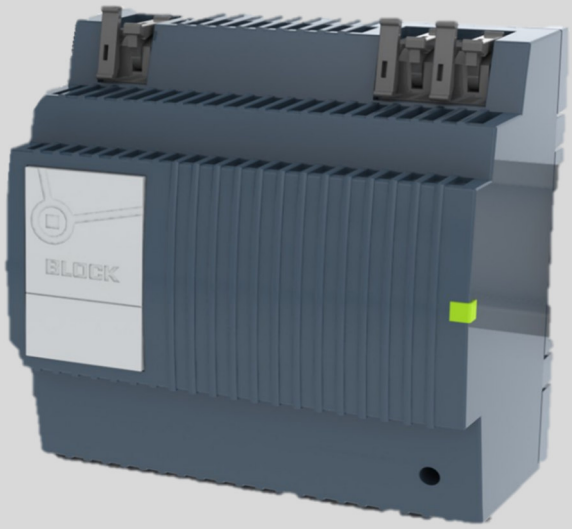
MANUAL

UNINTERRUPTIBLE
POWER SUPPLY



Capacitive UPS power supply
PEL-4124-013-01

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TABLE OF CONTENTS

1. ORDER DATA

The following table shows the order data for the capacitive UPS power supplies.

Table 1: Order numbers

Variant	Input voltage	Output current
PEL-4124-013-01	24 Vdc	1,3 A
PCC-4124-040-01	24 Vdc	4 A

2. GENERAL NOTES

2.1 Safety instructions

Please read these warnings and safety instructions carefully before operating the appliance. The appliance may only be installed by skilled and qualified personnel. In the event of malfunctions or damage, switch off the supply voltage immediately and send the device to BLOCK Transformatoren-Elektronik GmbH for inspection. The device does not contain any service parts. If an internal fuse blows, there is most likely an internal defect in the appliance. The data provided is for product description purposes only and should not be construed as guaranteed characteristics in the legal sense.

2.2 Qualified Personnel

The product associated with this documentation may only be handled by qualified personnel in compliance with the documentation associated with the respective task, in particular the safety instructions and warnings contained therein. Qualified personnel can ensure, on the basis of their training and experience, that the use of the described product complies with all safety requirements and the applicable provisions, regulations, standards and laws.

2.3 Intended use

This device is designed for installation in an enclosure and is suitable for use in general electronic devices such as industrial control systems, office equipment, communication devices or measuring devices. Do not use this device in control systems of airplanes, trains or nuclear facilities where a malfunction could lead to serious injury or danger to life.

2.4 Disclaimer

The contents of this publication have been checked with the utmost care to ensure that they correspond to the hardware and software described. Nevertheless, there may be discrepancies between the product and the documentation. Deviations may also arise due to the continuous further development of the product.
For this reason, we cannot guarantee complete conformity. Should this documentation contain errors, we reserve the right to make any necessary corrections without prior notice.

ATTENTION
Switch off the input voltage before carrying out installation, maintenance or modification work and secure it against unintentional reconnection.

ATTENTION
Do not make any changes or attempts to repair the device. Do not open the device!

ATTENTION
Prevent the ingress of foreign objects such as paper clips and metal parts.

ATTENTION
Do not operate the appliance in a damp environment or in an environment where condensation or condensation is to be expected.

ATTENTION
Do not touch the housing during operation or shortly after switching off. Hot surfaces can cause injuries.

3. Productdescription

The **PEL-4124-013-01** is a switched-mode power supply with integrated energy storage. In normal operation, it works as a conventional switched-mode power supply. In the event of a mains failure, the device can buffer a current of up to1Afora maximum of 5 seconds. This makes itpossibleto safely shut down connected loads and save critical data.

The integrated buffer module meets the requirements of **VDE-AR-N 4105** and **TOR generators**. It is therefore suitable for use in **photovoltaic systems** for buffering the control and communication electronics in the event of power failures.

Figure 1: PEL-4124-013-01

3.1 Technical data

deutsch | english

Technische Daten	Technical data	PEL-4124-013-01
Eingangsdaten	**Input data**	
Eingangsnennspannung	Rated input voltage	200 - 240 Vac
Eingangsspannungsbereich	Input voltage range	180 - 264 Vac
Nennfrequenzbereich	Frequency range	44 Hz - 66 Hz
Eingangsnennstrom (Nennlast)	Nominal input current (nominal load)	0,5 A (230 Vac)
Einschaltstrombegrenzung	Inrush current limitation	< 30 A, NTC
Eingangssicherung intern	Internal fuse	2 AT
Empfohlene Vorsicherung	Recommended external protection	6 A, 10 A, 16 A, Charakteristik B, C
Ausgangsdaten	**Output data**	
Ausgangsspannung	Rated output voltage	24,5 Vdc ±2 %
Ausgangsstrom	Rated output current	1,3 A
Überlastverhalten	Overloadbehaviour	Konstantstrom (U/I Kennlinie) Constant current (U/I Line)
Parallelschaltbar	Parallel operation	
Serienschaltbar	Serial operation	
Wirkungsgrad	Efficiency	typ. 82 %
Verlustleistung (Leerlauf / Nennlast / Maximum)	Power loss (idle / nominal load / typ. maximum)	2,6 W / 7 W / 7,3 W
Restwelligkeit (Nennlast)	Residual ripple (nominal load)	typ. 100 mV_{ss}
Integrierte Pufferung	**Integrated buffering**	
Pufferzeit	Backup time	5s (1A) +/- 10%
Pufferschwelle	Buffer threshold	<150 Vac
Ausgangsspannung im Pufferbetrieb	Output voltage in buffer mode	24,5V +/- 2%
Ladezeit beim Neustart	Loading time at restart	< 180s
Speichertechnologie	Storage technology	Superkondensator Supercapacitor
Signalisierung	**Signaling**	
Betriebsanzeige	Power indicator	LED grün LED green
Umwelt	**Environment**	
Lagertemperatur	Storage temperature	-25 °C ... +80 °C
Umgebungstemperatur	Operational temperature	-25 °C ... +55 °C
Derating	Derating	-3%/K > 45°C
Einbaulage	Mounting position	waagerecht für Tragschiene TH 35, horizontal for Rail TH 35
Zulässige Luftfeuchtigkeit	Allowable humidity	5 bis 96 % relative Feuchte, keine Betauung zulässig 5 to 96 % relative humidity with no dew
Strombelastbarkeit bei beliebiger Einbauanlage	Current rating at any mounting position	max. 0,9 A
Kühlung (Abstand zu benachbarten Teilen)	Cooling (spacing to vicinal components)	kein Mindestabstand rechts/links erforderlich, 50 mm oben/unten No minimum spacing right/left required, 50 mm over/under
Sicherheit und Schutz	**Safety and protection**	
Schutzart	Protection index	IP20
Prüfspannung	HV test voltage	4,2 kVdc
Schutzklasse	Safety class	II (im geschlossenen Schaltschrank) II (in the closed Cabinet)
Anschlusskabel	Conductors	Zum Anschluss Kupferkabel mit min. 75 °C verwenden Use Copper Conductors only, rated min. 75 °C
Einsatzbereich	Installation	Einsatz in Bereichen mit Verschmutzungsgrad 2 For installation in Pollution Degree 2 environment
Überspannungskategorie	Overvoltage category	II
Rückspeisungsfestigkeit	Feedback voltage	max. 30 Vdc
Normen	**Safety standards**	
Sicherheit	Safety	EN 61558-2-16
EMV	EMC	EN 61204-3
Mechanische Daten	**Mechanical data**	
Gewicht	Weight	0,3 kg
Maße (B x H x T)*	Dimensions (W x H x D)*	90 x 89 x 55 mm
Anschlüsse Eingang (N, L)	Terminals input (N, L)	Federzug, max. 2,5 mm² Spring-clamp terminals max. 2.5 mm²
Anschlüsse Ausgang (-, -, +, +)	Terminals output (-, -, +, +)	Federzug, max. 2,5 mm² Spring-clamp terminals max. 2.5 mm²
Bestellnummern	**Order Numbers**	
Bestellnummer	Order Number	PEL-4124-013-01

* Tiefe T ab Oberkante Tragschiene.
depth from upper edge of DIN rail.

Figure 2: Technical data

3.2 Functionaldiagram

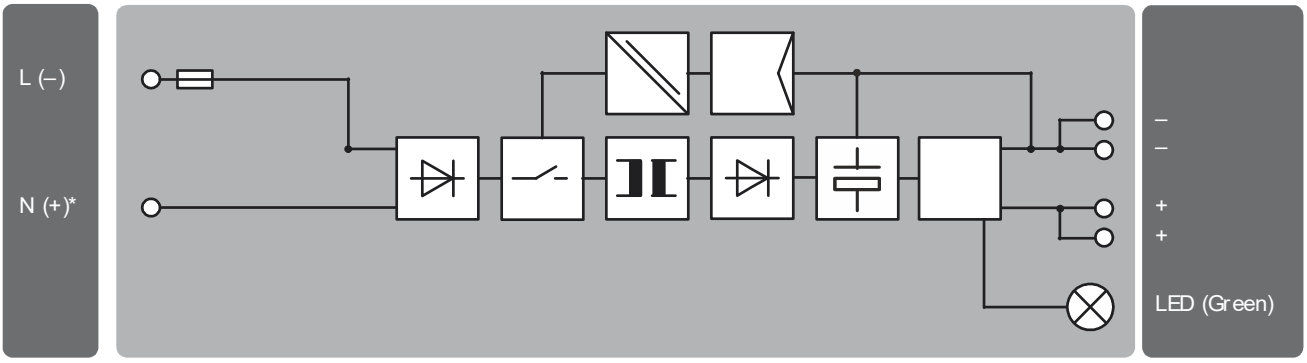


Figure 3: Functionaldiagram PEL-4124-013-01

3.3 Dimensioning

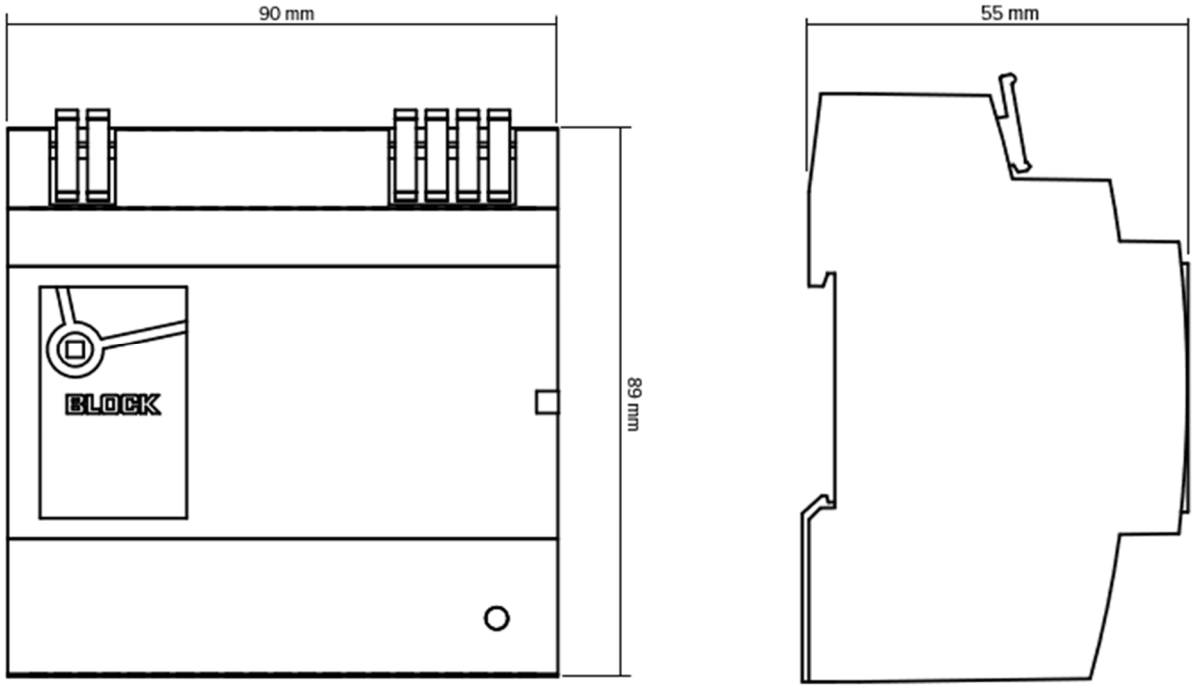


Figure 4: Dimensioning PEL-4124-013-01

3.4 Assembly

The capacitive UPS-Power supply can be mounted on the DIN rail without tools.
To do this, first turn the front of the device slightly upwards and place it on the top-hat rail. Make sure that the device is pushed down as far as it will go. If the device is seated on the top-hat rail, the underside is pressed against the mounting rail until it locks into the top-hat rail (followed by a "click" sound). To check, gently shake the device again to ensure that it is properly locked.
A standard tool, such as a slotted screwdriver, is required for removal. The device can be detached from the top-hat rail by lifting the underside of the device and pressing down on the fastening.

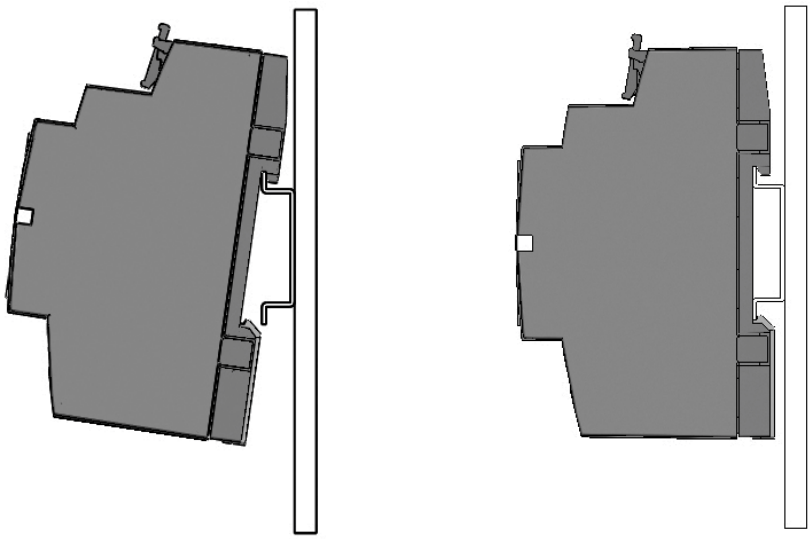


Figure 5: Assembly

To ensure cooling by natural convection, the distances to neighboring appliances must be observed.

Attention:
Deviating installation is **not** permitted

Attention:
Mounting the buffered power supply unit upside down is **not** permitted.

Attention:
Do not touch the housing during operation or shortly after switching off.
Hot surfaces can cause injuries.

3.5 Connections and signaling

Figure 6: Connections

Table 2: Connections

Nr.	Function	Note
1	Output terminals of the power supply	Spring-loaded terminals. Max. 2,5mm² (-, -, +, +)
2	Input terminals of the power supply	Spring-loaded terminals. Max. 2,5mm² (+, -)

4. Commissioning

1. Assembly

Mount the buffer module on a standard 35 mm DIN top-hat rail in the control cabinet. Ensure adequate ventilation and that the permissible ambient temperature of +55 °C is not exceeded.

2. Connecting the input voltage (24V DC)

Connect the 24V DC supply to the "Input" terminals of the module (plus (+) and minus (-)). Pay attention to the correct polarity. The input current should be at least 0.2A higher than the connected load to ensure safe recharging of the supercapacitors.

3. Connecting the load

Connect the consumer load to the module's "output" terminals **(plus (+) / minus (-)).** The maximum output current is **1.3 A.** Thanks to **active decoupling**, there is no feedback to the source in the event of a voltage dip - the output voltage remains stable.

4. Switch on the power supply

After correct connection, the input voltage can be switched on.

5. Temperature behavior

The module is suitable for use up to an ambient temperature of +55 °C. After this, derating takes effect to protect the components inside the power supply unit.

4.1 Buffer operation

If the mains voltage fails, the system switches to buffer mode without interruption. The energy required to maintain the DC 24 V supply voltage is provided from the internal memory of the buffer module. This is possible up to a maximum of 5 A for one second, e.g. to be able to energize a contactor in the event of a power failure in PV systems.

4.2 Life expectancy

The service life of supercapacitors—and thus also of the entire device—depends largely on one factor:

- The ambient temperature

At an ambient temperature of 25°C, the expected service life is approximately 262,800 hours. This corresponds to an electrical output of over 30 years. The manufacturer provides a 15-year warranty on mechanical components such as seals, etc.

After this operating period, the remaining capacity of the supercapacitors is approximately 70% of the initial value.

Note on aging:

During the first approx. 200 operating hours, capacity decreases by around 15%. After that, capacity decreases linearly until reaching the specified final value of 70%.

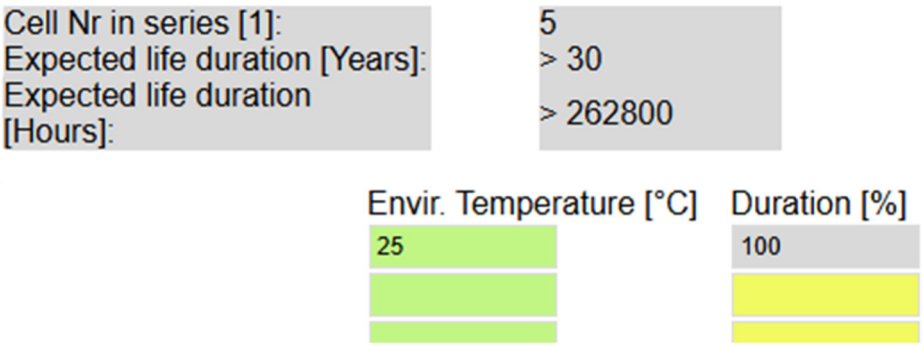


Figure 7: Service life with derating

4.3 Operating states

The capacitive UPS-Power supply **PEL-4124-013-01** has a green LED to indicate the operating status. After the power supply unit is switched on, the LED lights up continuously to indicate that the device is active and that an output voltage of24V is present.
After an initialization time of approx. **3 minutes**, the power supply unit is ready to provide short-term buffering in the event of a power failure.

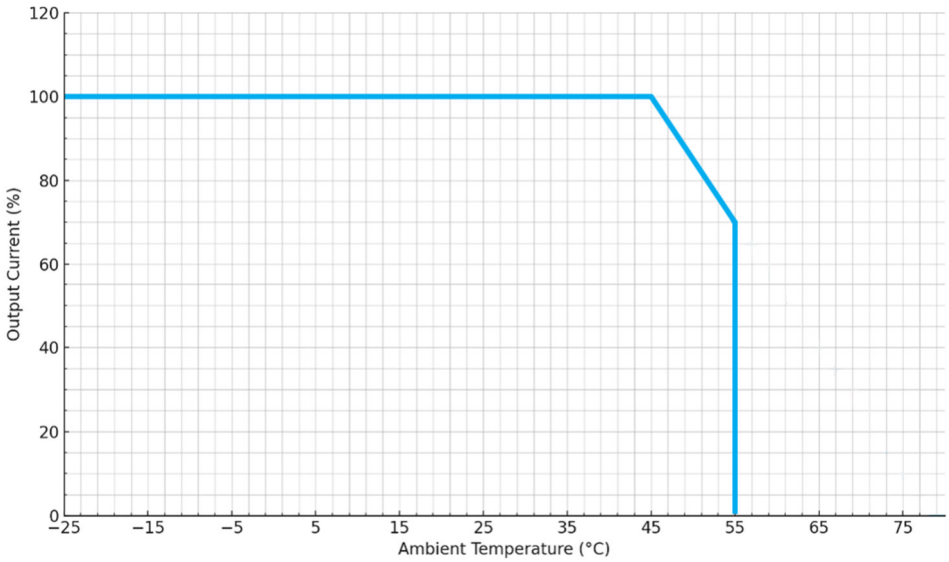
4.4 Buffer times

The capacitive UPS-Power supply **PEL-4124-013-01** secures the24V DC power supply in the event of brief mains interruptions by using integrated, maintenance-free supercapacitors. In the event of a voltage dip, thedeviceautomatically takes overthe supply to the connected loads and thus protectsyour application from downtime or data loss.
The actual achievable buffer time depends on the respective load current. The following table shows the typical buffer times as a function of the connected load and serves as a basis for system-compatible design.

Current	1A	0,5A	0,1A
Buffertime	5 Seconds	13 Seconds	30 Seconds

4.5 Derating

Compliance with the thermal operating limits is crucial for reliable operation of the **PEL-4124-013-01**. The device is designed for use in an ambient temperature range of **-25°C to +55°C**. From an ambient temperature of **+45°C**, however, a temperature-dependent derating must be taken into account.
The maximum permissible output current is reduced above **+45°C** by a factor of **-3 % per Kelvin**. This serves to thermally protect the components and ensures a long service life and safe operation even at high ambient temperatures.



5. Maintenance

5.1 Storage of the buffered power supply unit

The capacitive UPS-Power supply is supplied in an uncharged state. In this condition, it should not be stored above+80°C or below-25°C.

6. Disposal and recycling

Ensure proper disposal of electronic components

Do not dispose of the power supply with household waste.

Observe the applicable national regulations.

Ensure proper disposal or recycling

Dispose of or recycle packaging material that is no longer required with household waste.

Observe the applicable national regulations.