

MANUAL

Uninterruptible
power supply



Buffer module PCC-1424-400-0

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1. Order Data

The following table shows the ordering data for the capacitive UPS and the capacity modules.

Table 1: Order numbers

Capacitive buffer module			
Variant	Input voltage	Output current	Nominal capacity
PCC-1424-400-0	24 Vdc	40A	326 Ws

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, based on 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 a housing 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 result in serious injury or danger to life.

2.4 Disclaimer

The content of this publication has been checked with the utmost care to ensure that it corresponds to the hardware and software described. Nevertheless, there may be discrepancies between the product and the documentation. Deviations may also occur 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. Product description

The PCC-1424-400-0 is a powerful capacitive buffer module for reliably bridging short-term power failures or voltage dips in 24 VDC supply systems. With a high capacity of 360Ws, it protects critical loads from voltage fluctuations and thus increases operational reliability and system availability.

Thanks to the maintenance-free Electrolytic Capacitor technology, the module operates wear-free and offers a long service life with high cycle stability. The PCC-1424-400-0 is ideal for use in automation and control applications where short failures could lead to process disruptions or data loss.



Figure 1: PCC-1424-400-0

3.1 Technical data

Technische Daten

Technical data

PCC-1424-400-0	
Normen Safety standards	
Sicherheit Safety	EN 61010-1, EN 61010-2-201
EMV EMC	EN 61000-6-2, EN 61000-6-3
Zulassungen Approvals	
UL	in Vorbereitung pending
DNVGL	in Vorbereitung pending
Umwelt Environment	
Umgebungstemperatur Ambient temperature	-25 °C ... +70 °C
Lagertemperatur Storage	-25 °C ... +85 °C
Kühlart cooling	Selbstkühlung durch natürliche Konvektion bei vertikaler Einbauanlage AN (Natural air convection cooling)
Derating Derating	-
Zulässige Luftfeuchtigkeit Allowable humidity	5 ... 96 % relative Feuchte, keine Betauung zulässig 5 ... 96 % relative humidity with no dew
Verschmutzungsgrad Pollution degree	2
Betriebshöhe Operating altitude	5000m
Sicherheit und Schutz Safety and protection	
Prüfspannung (Klemmen gegen Gehäuse) HV test voltage (terminals and enclosure)	500 Vdc
Schutzart Protection index	IP 20 (nach EN 60529) IP 20 (to EN 60529)
Schutzkleinspannung (SELV/PELV) Safety-extra-low voltage (SELV/PELV)	EN 61010-1 (SELV), EN 61010-2-201 (PELV)
Schutzklasse Safety class	III
Verpolungsschutz Reverse connection protection	✓
Eingang Input	
Eingangsnennspannung Rated input voltage	24 Vdc
Eingangsspannungsbereich Operating input voltage range	19,2 ... 30 Vdc (24V +25% & -20%)
Stromaufnahme bei 24 Vdc (Leerlauf/Ladevorgang/max.) Input current at 24 Vdc (standby/charging process/max.)	0,03 A / 0,8A / 0,8A
Anschlüsse Eingang Terminals Input	Push-In, max. 16 mm (siehe Tab.1 / see Tab.1) ²
Ausgang Output	
Ausgangsspannung Rated output voltage	24 Vdc
Ausgangsspannung (Normalbetrieb, Nennlast) Operating output voltage (normal operation)	typ. U _{in} - 0,25 Vdc (Entkopplung via MosFet) (Decoupling via MosFet)
Ausgangsspannung (Pufferbetrieb, Nennlast) Operating output voltage (buffer operation)	typ. Pufferschwelle - 0,25 Vdc typ. buffer threshold - 0,25 Vdc (Entkopplung via MosFet) (Decoupling via MosFet)
Ausgangsstrom Operating output current	40 A
Überlastverhalten Over load behaviour	Elektronisch begrenzt. Abschaltung des Moduls unter 17V und entladen der Kondensatoren. Electronically limited. Switching off the module below 17V and discharging the capacitors.
Fernabschaltung für NOT AUS des Pufferbetriebs Remote power off (buffer operation)	✓
Max. Verlustleistung (Leerlauf/ Nennbetrieb) Max. power loss (idling/ nominal load)	tbd
Rückspesiefestigkeit Feedback voltage	max. 35 Vdc
Anschlüsse Ausgang Terminals output	Push-In, max. 16 mm (siehe Tab.1 / see Tab.1) ²
Energiespeicher Energy storage	
Art des internen Speichers Type of internal memory	Electrolytic Capacitor
Größe des internen Speichers Size of the internal memory	326 Ws
Lebensdauer Life cycle	25 °C / 10 Jahre 25 °C / 10 years
Ladestrom Charging current	0,8 A / 0,6 A / 0,4 A
Ladezeit Charge time	30sek. / 45sek. / 60sek (Einsatzbereit immer nach 30sek.) 30 sec / 45 sec / 60 sec (always ready for use after 30 sec)
Signalisierung Signaling	
LED LED	grün green
Potenzialfreier Kontakt Potential free signal contact	1 x Schließer 1 x NO
Anschlüsse Signalisierung Terminals Signaling	Push-In, max. 2,5 mm (siehe Tab.1 / see Tab.1) ²
Sonstiges Various	
Maße B x H x T* Dimensions width x height x depth*	58 x 127 x 141,5 mm
Gewicht Weight	1,1 kg

* Maße ohne Anschlussstecker, Tiefe T ab Oberkante Tragschiene.

* Dimensions without terminals, depth from upper edge of DIN rail.

3.2 Block diagram

The following block diagram shows a wiring example of the PCC-1424-400-0.

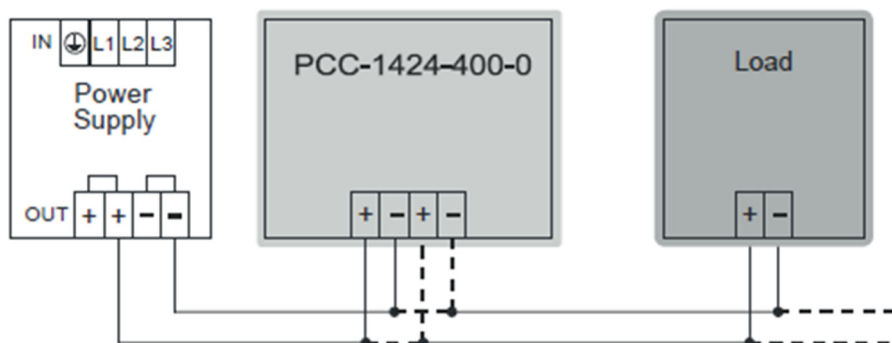


Figure 2: Block diagram

3.3 Functional diagram

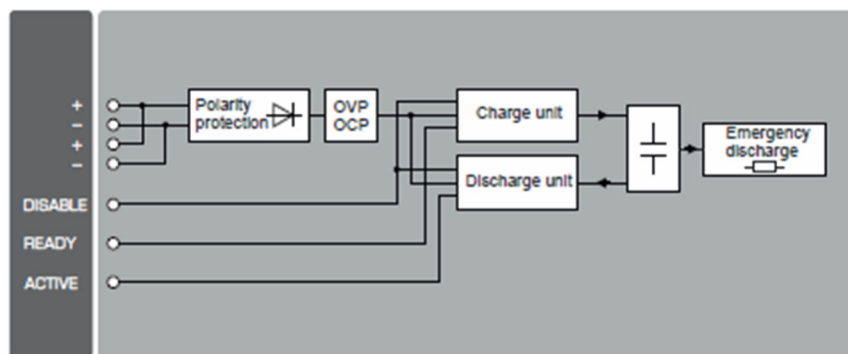


Figure 3: Functional diagram

3.4 Dimensioning

The dimensions of the capacitive buffer module are shown in Figure 4.

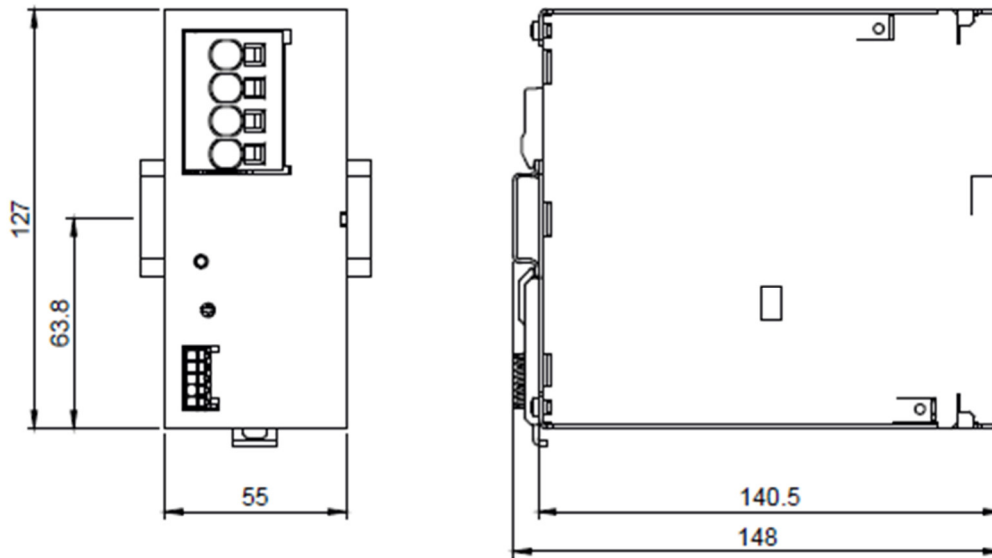


Figure 4: Dimensioning (PCC-1424-400-0)

3.5 Assembly

The capacitive buffer module 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 DIN rail. Make sure that the device is pushed down as far as it will go. When 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.

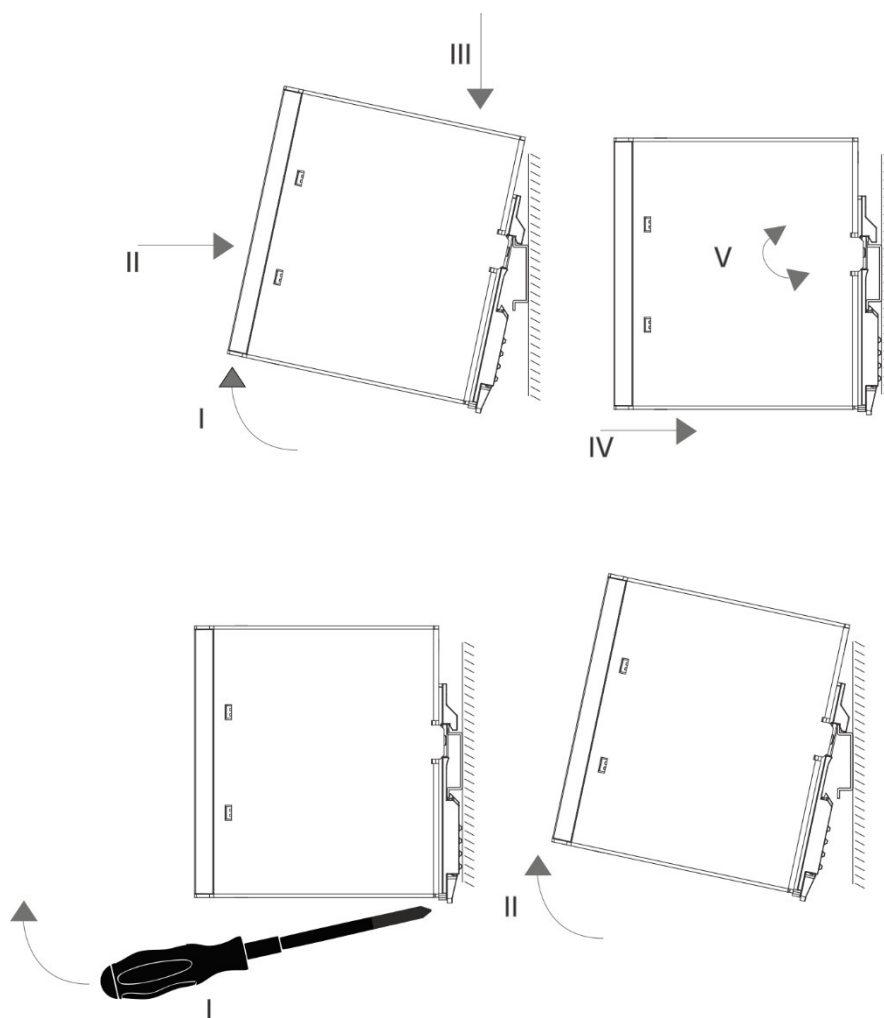


Figure 5: Assembly



ATTENTION:

Mounting the capacitive buffer module sideways or overhead is **not** permitted

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

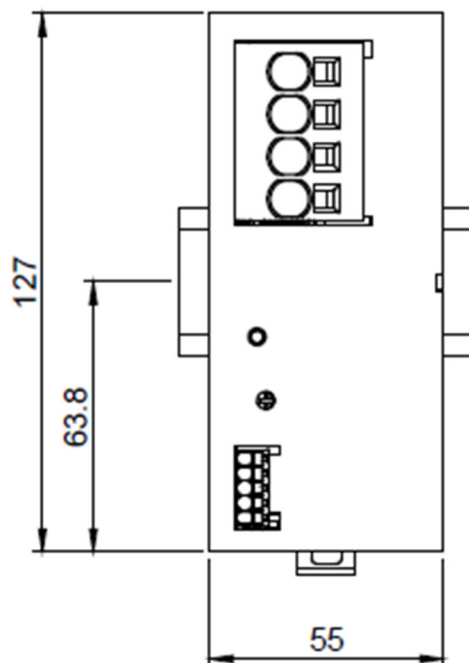
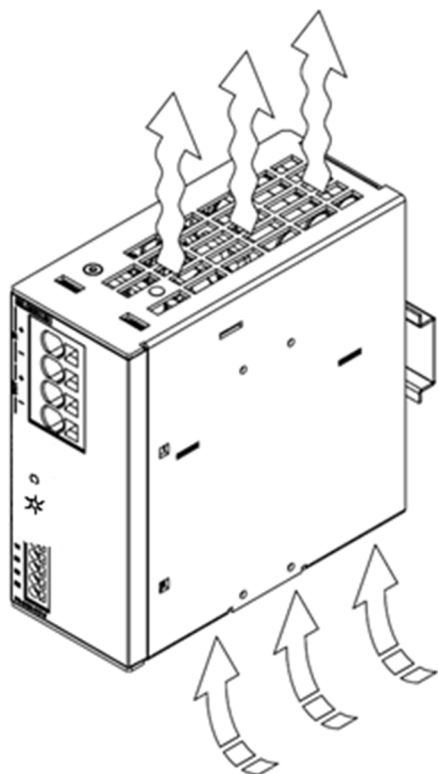


Figure 6: Convection cooling



ATTENTION:

Any other installation is not permitted.



ATTENTION:

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

3.6 Connections and signaling

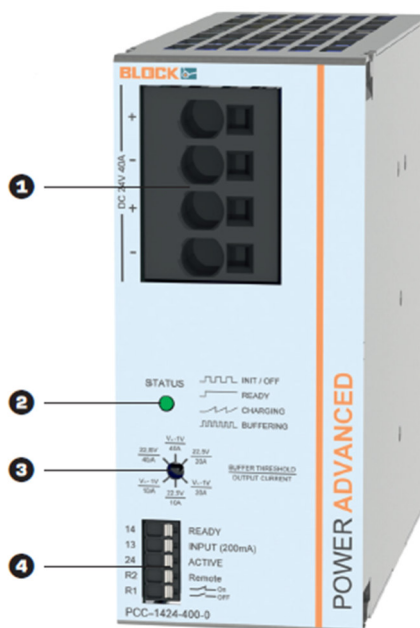


Table 3: Connections and signaling

Nr.	Function	Note	
1	Input/output terminals of the power supply	0,75 - 16 mm ²	
2	Signal light	LED green: DC OK	
5	Setting the buffer threshold, the buffer current and the charging current in 6 positions	Pos. 1: 22,5V, 40A, 0,8A Pos. 2: Vin -1V, 40A, 0,8A Pos. 3: 22,5V, 20A, 0,6A	Pos. 4: Vin-1V, 20A, 0,6A Pos. 5: 22,5V, 10A, 0,4A Pos. 6: Vin-1V, 10A, 0,4A
4	Signal and signaling contacts	13: Potential-free collective input for signal outputs 14/24 14: Display device buffer ready 24: Display device in buffer mode R1/R2: Remote switch-off in buffer mode 0,2 - 2,5 mm ²	

4. Commissioning

The capacitive buffer module is discharged on delivery, which is why it is not yet ready for operation. Buffer operation is only available after a charging time of 30 seconds. Depending on which setting is selected on the rotary switch on the front, the buffer module has a charging time of 30, 45 or 60 seconds.

4.1 Operating states / signaling

The operating status of the capacitive buffer module can be viewed via the LED status display. The light signals have the following meaning.

Table 4: Signaling via LED status display

Operating status	Buffer ready	LED	Message contact 13/14 (READY)	Signal contact 13/24 (ACTIVE)
Initialization	No	Slow flashing		
Charging mode	No	Slow pulsation		
Charging operation interrupted due to undervoltage	No	Fast pulsation		
Ready for operation	Yes	Permanently on		
Buffer operation	Yes	Fast flashing		
Device error	No	Fast flashing		

4.2 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 taken from the memory of the capacitive buffer module.

Buffer operation is signaled by the rapid flashing of the green LED.

Remote switch-off in buffer mode

If the load connected to the output of the capacitive buffer module is no longer to be supplied during buffer operation, e.g. in "EMERGENCY OFF" mode, buffer operation can be deactivated. To do this, the connection between the two contacts R1/R2 of the "Remote" input must be interrupted.

If this connection is not present in normal operation, the module signals the fault "no buffer operation possible". The green LED flashes quickly.

4.3 Buffer times

The Buffer module PCC-1424-400-0 guarantees an uninterruptible 24V DC power supply thanks to the use of maintenance-free supercapacitors. In the event of mains failures or voltage dips, the device automatically takes over the load supply to ensure the safe operation of your system.

The possible buffer time depends largely on the current load current. The following table provides an overview of the typical buffer times depending on the connected load and helps you to design your system.

Table 5: Buffer time PCC-1424-400-0

Current	40A	20A	10A	5A	3A	2A	1A	0,5A	0,1A
Buffertime	250 ms	500 ms	1000 ms	2,5 Sek.	4,5 Sek.	6,5 Sek.	11 Sek.	23 Sek.	82 Sek.

4.4 Derating

The **PCC-1424-400-0** buffer module is designed in such a way that it **does not** require **any derating** within the specified temperature and voltage range. This means that the full rated power of **24V / 40 A** can be provided continuously under the operating conditions specified in the data sheet - **without any loss of performance**.

5. Maintenance

5.1 Service life of theof the capacitive buffer module

The service life of the **PCC-1424-400-0** buffer module is largely dependent on the **operational loads** and the **ambient temperature**. In particular, the level and duration of the currents drawn during buffer operation and the thermal load have a direct influence on the ageing of the installed double-layer capacitors (supercaps).

The manufacturer of the supercaps used specifies a maximum service life of **10 years at a constant ambient temperature of +25°C** under nominal conditions. However, this specification may vary in real applications:

- **Higher temperatures** lead to accelerated ageing and therefore to a shorter service life.
- **Frequent or long-lasting buffer cycles** with high currents increase the electrical load and reduce the capacity of the storage cells over time.

5.2 Storage of theof the buffer module

The capacitive buffer module is supplied in an uncharged state. In this state, it should not be stored above 85 °C or below -25 °C.

6. Disposal and recycling



Ensure proper disposal of electronic components

Please do not dispose of the power supply with household waste.

Observe the applicable national regulations for the disposal of electronic components.



Ensure proper disposal or recycling

Please recycle and dispose of the packaging material in an environmentally friendly manner.

Please observe the applicable national regulations.