

Power supply CP-D 12/0.83

Primary switch mode power supply

The CP-D range of modular power supply units in MDRC design (modular DIN rail components) is ideally suited for installation in distribution panels. This range offers devices with output voltages of 12 V DC and 24 V DC at output currents of 0.42 A to 4.2 A. Thanks to a high thermal efficiency corresponding to low power and heat dissipation, the devices can be operated without forced cooling. This device features hiccup output characteristic. All power supply units in the CP-D range are approved according to all relevant international standards.



2CDC 271 024 F0007

Characteristics

- Rated output voltage 12 V DC
- Rated output current 0.83 A
- Rated output power 10 W
- Wide range input 100–240 V AC (90–264 V AC, 120–375 V DC)
- Efficiency of typ. 78 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation –40...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Hiccup mode
- LEDs for the indication of operational states
- Structural form ideal for installation in distribution panels
- Light-grey enclosure in RAL 7035

Approvals

- UL 508, CAN/CSA C22.2 No.107.1 ¹⁾
- UL 1310, CAN/CSA C22.2 No.223 (Class 2 Power Supply) ¹⁾
- UL 60950, CAN/CSA C22.2 No.60950 ¹⁾
- EAC ¹⁾
- CCC ¹⁾

¹⁾ Approval refers to rated input voltage U_n

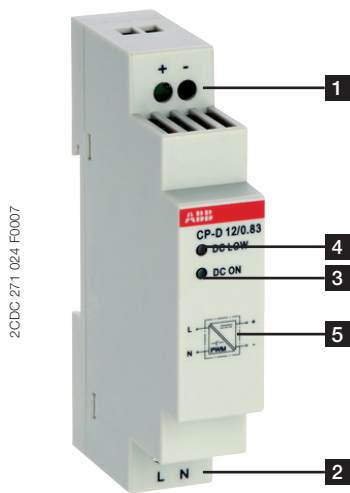
Marks

- CE
- RCM

Order data

| Type | Input voltage range | Rated output voltage / current | Order code |
|--------------|----------------------------|--------------------------------|-----------------|
| CP-D 12/0.83 | 90–264 V AC / 120–375 V DC | 12 V DC / 0.83 A | 1SVR427041R1000 |

Functions



- 1** OUTPUT +, -:
terminals – output
- 2** INPUT L, N:
terminals – input
- 3** DC ON:
green LED – output voltage applied
- 4** DC LOW:
red LED – output voltage too low
- 5** Circuit diagram

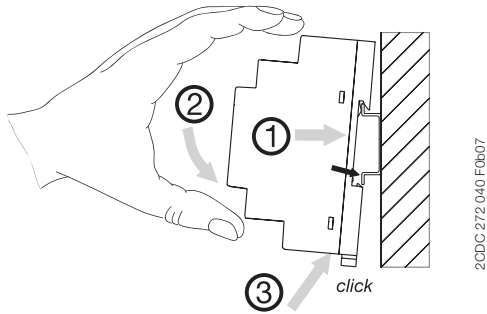
Application

The primary switch mode power supply has two voltage input ranges. This enables the supply with AC or DC. Furthermore it is equipped with two generous capacitors, which ensure mains buffering of at least 30 ms. That is why the device can be used worldwide also in high fluctuating networks and battery-powered plants.

Installation

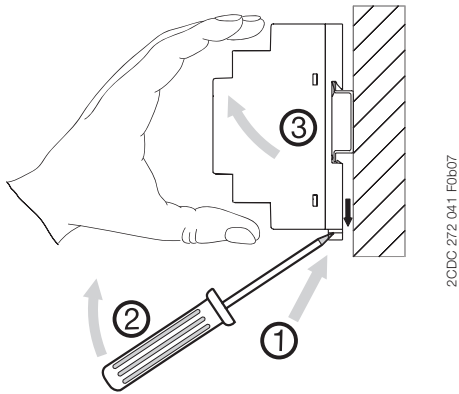
Mounting

The switch mode power supply can be snapped on a DIN rail according to IEC/EN 60715 as shown in the accompanying picture. For that the device is set with its mounting rail slide on the upper edge of the mounting rail and locked by lifting it downwards.



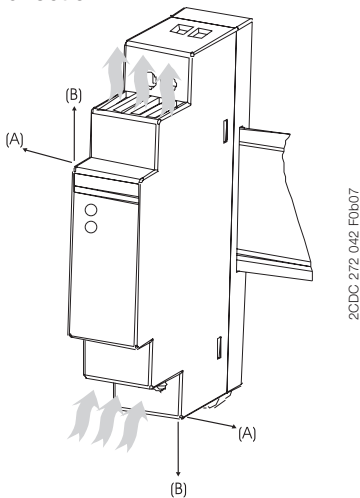
Demounting

Remove the switch mode power supply as shown in the accompanying picture. For that the latching lever is pulled downwards by means of the screwdriver. Alternatively you can press the unlock button to release the device. Then in both cases the device can be unhinged from the mounting rail edge and removed.



Mounting position

The devices have to be mounted horizontally with the input terminals on the bottom. In order to ensure a sufficient convection, the minimum distance to other modules should not be less than 25 mm in vertical direction and horizontal direction.

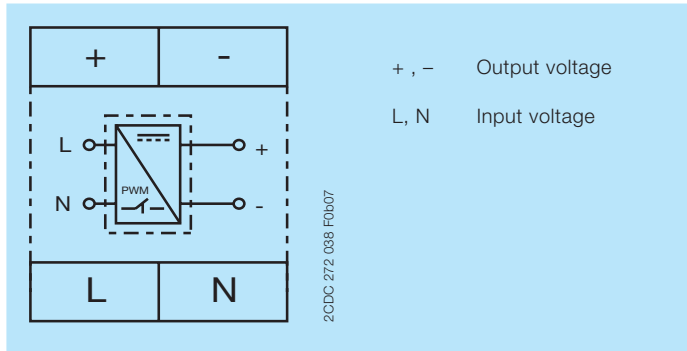


Electrical connection

Connect the input terminals L and N. The installation must be executed acc. to EN 60950, provide a suitable disconnecting device (e. g. line protection switch) in the supply line. The input side is protected by an internal input fuse.

Rate the lines for the maximum output current or provide a separate fuse protection. We recommend to choose the cable section as large as possible in order to minimize voltage drops. Observe the polarity. Actuate plug connector only when power is off. The device is overload, short-circuit and open-circuit proof. The secondary side of the power supply is electrically isolated from the input and internally not earthed (SELV) and can therefore be earthed by the user according to the needs with + or - (PELV).

Connection diagram



Safety instructions and warnings

The device must be installed by qualified persons only and in accordance with the specific national regulations (e. g. VDE, etc.). CP-D power supplies are chassis-mounted units. They are maintenance-free and do not contain any integral setting elements and should therefore not be opened.



Before any installation, maintenance or modification work:

Disconnect the system from the supply network and protect against switching on!

Before start of operation the following must be ensured:

- Connect to main according to the specific national regulations.

Power supply cables and unit must be sufficiently fused. A disconnecting device has to be provided for the end product to disengage unit and supply cables from supply mains if required.

- Rate the output lines for the output current of the power supply and connect them with the correct polarity.
- In order to ensure sufficient air-cooling the distance to the other devices has to be considered.

Attention! Improper installation/operation may impair safety and cause operational difficulties or destruction of the unit.

In operation pay attention to:

- Do not modify the installation (primary and secondary side)! High current! Risk of electric arcs and electric shock (danger to life)!
- Risk of burns: Depending on the operation conditions the enclosure can become very hot.
- If the internal fuse blows, most probably the device is defect. In this case, an examination of the switch mode power supply by the manufacturer is necessary.



Attention! Danger to life!

Disconnect the system from the supply network before executing any works at the device and protect against switching on!

The power supply contains components with high stored energy and circuits with high voltage! Do not introduce any objects into the unit and do not open the unit.

With some units of this range the output is capable of providing hazardous energy. Ensure that the service personnel is protected against inadvertent contact with parts carrying energy.



Technical data

Data at $T_a = 25\text{ °C}$, $U_{in} = 230\text{ V AC}$ and rated values, unless otherwise indicated

Input circuits

| Supply circuits | | |
|--|----------|----------------------------|
| Rated input voltage U_{in} | L,N | 100–240 V AC |
| Typical input current / power consumption | 115 V AC | 200 mA / 12.68 W |
| | 230 V AC | 128.3 mA / 13.01 W |
| Input voltage range | AC | 90–264 V AC |
| | DC | 120–375 V DC |
| Frequency range | AC | 47–63 Hz |
| Inrush current | 115 V AC | max. 16 A |
| | 230 V AC | max. 32 A |
| Power failure buffering time | | min. 30 ms |
| Internal input fuse (apparatus protection, not accessible) | | 1 A slow-acting / 250 V AC |
| Power factor correction (PFC) | | no |

User interface

| Indication of operational states | | |
|----------------------------------|------------------|---|
| Output voltage | DC ON: green LED |  : output voltage applied |
| | DC LOW: red LED |  : output voltage too low |

Output circuits

| | | |
|---|---|---|
| Rated output voltage | +, - | 12 V DC |
| Tolerance of the output voltage | | $\pm 1\%$ |
| Rated output power | | 10 W |
| Rated output current I_r | $T_a \leq 60\text{ °C}$ | 0.83 A |
| Derating of the output current | $60\text{ °C} < T_a \leq 70\text{ °C}$ | 2.5 %/°C |
| Deviation | load change statical | max. 1 % |
| | change of output voltage within the input voltage range | max. 1 % |
| Control time | | < 1 ms |
| Starting time after applying supply voltage | at I_r | 1000 ms |
| Rise time | at rated load | typ. 1 ms |
| Residual ripple and switching peaks | BW = 20 MHz | 50 mV |
| Parallel connection | | yes, use of CP-D RU required |
| Series connection | | yes, to increase voltage |
| Resistance to reverse feed | | 18 V / 1 s |
| Characteristic curve of output | | hiccup |
| Short-circuit protection | | continuous short-circuit stability |
| Short-circuit behaviour | | continuation with output power limiting |
| Current limiting at short circuit | | typ. 1.4 A |
| Overload protection | | output power limiting |
| Overvoltage protection | | 15–16.5 V DC |
| No-load protection | | continuous no-load stability |
| Starting of capacitive loads | | unlimited |

General data

| | | |
|--|---------------------|--|
| Duty time | | 100 % |
| Dimensions (W x H x D) | | 18 x 91 x 57.5 mm (0.71 x 3.58 x 2.26 inches) |
| Material of housing | housing | Plastic |
| Efficiency | | typ. 78 % |
| Weight | | 0.066 kg (0.13 lb) |
| Mounting position | | horizontal |
| Minimum distance to other units in normal operation mode | horizontal | 25 mm (0.98 inch) |
| | vertical | 25 mm (0.98 inch) |
| Mounting | | DIN rail (IEC/EN 60715), snap-on mounting without any tool |
| Degree of protection | housing / terminals | IP20 / IP20 |
| Class of protection | | II |

Electrical connection

| | | |
|--------------------------------|-----------------------------------|-------------------------------------|
| Input circuit / Output circuit | | Screw connection |
| Connecting capacity | fine-strand with wire end ferrule | 0.2–1.5 mm ² (24–16 AWG) |
| | rigid | 0.2–2.5 mm ² (26–12 AWG) |
| Stripping length | | 4–5 mm (0.16–0.2 in) |
| Tightening torque | | 0.6 Nm (5 lb.in) |

Environmental data

| | | |
|---|-----------|-------------------------------------|
| Ambient temperature range | operation | -40...+70 °C (-40...+158 °F) |
| | full load | -40...+60 °C (-40...+140 °F) |
| | storage | -40...+85 °C (-40...+185 °F) |
| Altitude during operation (IEC/EN 60068-2-13) | | max. 4850 m |
| Damp heat, cyclic (IEC/EN 60068-2-30) | | 4 x 24 h cycles, 40 °C, 95 % RH |
| Vibration, half-sine (IEC/EN 60068-2-6) | | 50 m/s ² , 10 Hz – 2 kHz |
| Shock, half-sine (IEC/EN 60068-2-27) | | 40 m/s ² , 22 ms |

Isolation data

| | | |
|--|--------------------------------|---------|
| Rated isolation voltage U _i | input circuit / output circuit | 3 kV AC |
| Pollution degree | | 2 |
| Overvoltage category | | II |

Standards / Directives

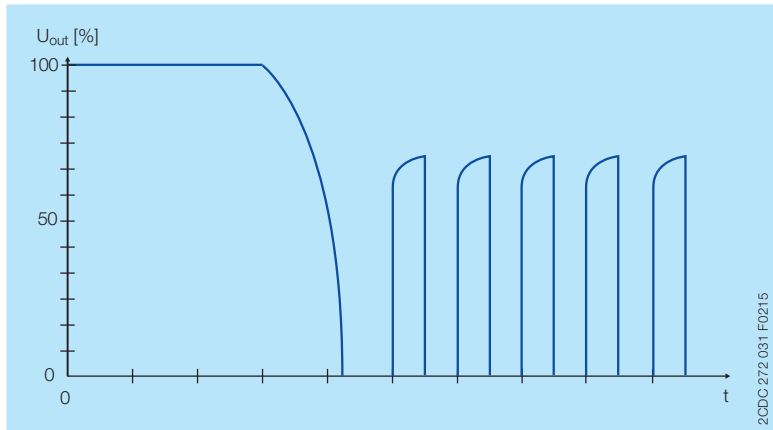
| | | |
|------------------------|--|-----------------------|
| Standards | | IEC/EN 60950-1 |
| Low Voltage Directive | | 2014/35/EU |
| Protective low voltage | | SELV (IEC/EN 60950-1) |
| EMC Directive | | 2014/30/EU |
| RoHS Directive | | 2011/65/EU |

Electromagnetic compatibility

| | | |
|---|------------------------|-----------------------|
| Interference immunity to | | IEC/EN 61000-6-2 |
| electrostatic discharge | IEC/EN 61000-4-2 | Level 4 (4 kV / 8 kV) |
| radiated, radio-frequency, electromagnetic field | IEC/EN 61000-4-3 | Level 3 (10 V/m) |
| electrical fast transient / burst | IEC/EN 61000-4-4 | Level 4 (4 kV) |
| surge | IEC/EN 61000-4-5 | Level 3 (2 kV L-L) |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6 | Level 3 (10 V) |
| Interference emission | | IEC/EN 61000-6-3 |
| high-frequency radiated | IEC/CISPR 22, EN 55022 | Class B |
| high-frequency conducted | IEC/CISPR 22, EN 55022 | Class B |

Technical diagrams

Output behaviour



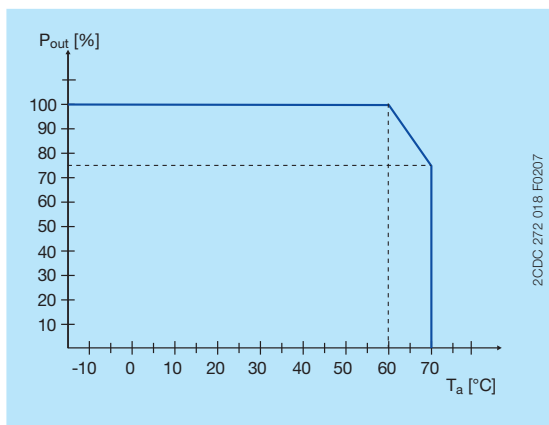
Hiccup of output at $T_a = 25\text{ }^\circ\text{C}$

The switch mode power supply CP-D 24/0.83 is able to supply at 24 V DC output voltage and

- at an ambient temperature of:
 $\leq 60\text{ }^\circ\text{C}$ a continuous output current of approx. 0.83 A
- at ambient temperatures of:
 $60\text{ }^\circ\text{C} < T_a \leq 70\text{ }^\circ\text{C}$ the output power has to be reduced by 2,5 % per $^\circ\text{C}$ temperature increase.

If the switch mode power supply is loaded with an output current $> 0.83\text{ A}$, the operating point is passing through the hiccup characteristic curve shown.

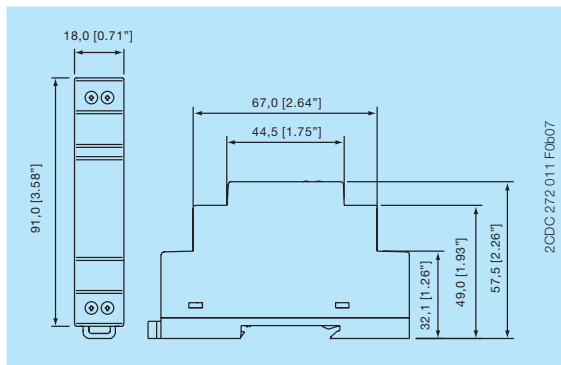
Temperature behaviour



Characteristic curve of temperature at U_{out}

Dimensions

in mm [inches]



Further Documentation

| Document title | Document type | Document number |
|--------------------------------|---------------------|--------------------|
| Electronic Products and Relays | Technical catalogue | 2CDC 110 004 C02xx |
| Power Supply Units | Application manual | 2CDC 114 048 M020x |

You can find the documentation on the internet at www.abb.com/lowvoltage
-> Automation, control and protection -> Power supplies.

CAD system files

You can find the CAD files for CAD systems at <http://abb-control-products.partcommunity.com>
-> Low Voltage Products & Systems -> Control Products -> Power Supplies.

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