

Power supply CP-D 24/4.2

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 the U/I output characteristic (fold forward behaviour). All power supply units in the CP-D range are approved according to all relevant international standards.



2CDC 271 029 F0007

Characteristics

- Rated output voltage 24 V DC
- Output voltage adjustable via front-face potentiometer "OUTPUT Adjust"
- Rated output current 4.2 A
- Rated output power 100 W
- Wide range input 100–240 V AC (90–264 V AC, 120–375 V DC)
- Efficiency of typ. 89 %
- 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
- U/I characteristic (fold-forward behaviour at overload – no switch-off)
- 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 62368-1, CAN/CSA-C22.2 No. 62368-1 ¹⁾UL 62368-1, CAN/CSA-C22.2 No. 62368-1 ¹⁾EAC ¹⁾

¹⁾ Approval refers to rated input voltage U_{in}

Marks



CE



RCM

Order data

Type	Input voltage range	Rated output voltage / current	Order code
CP-D 24/4.2	90–264 V AC / 120–375 V DC	24 V DC / 4.2 A	1SVR427045R0400

Functions



- 1 OUTPUT ++, --:
terminals – output
- 2 INPUT L, N:
terminals – input
- 3 DC ON:
green LED – output voltage applied
- 4 DC LOW:
output voltage too low
- 5 OUTPUT Adjust:
potentiometer – adjustment of output voltage
- 6 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 60 ms. That is why the device can be used worldwide also in high fluctuating networks and battery-powered plants.

Operating mode

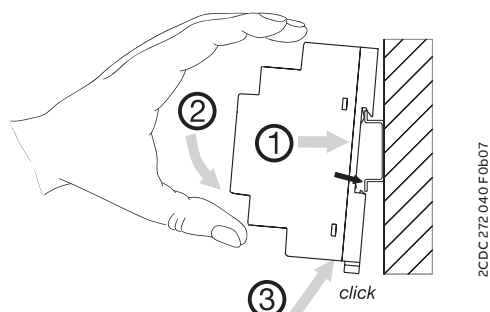
Adjustable output voltage

This device features an continuously adjustable output voltage from 24–28 V DC. Thus they can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.

Installation

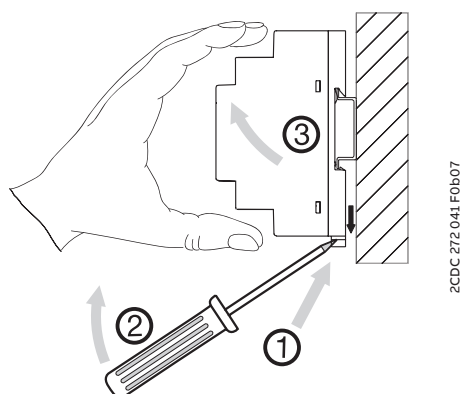
Mounting

The switch mode power supply can be snapped on a DIN rail according to 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.



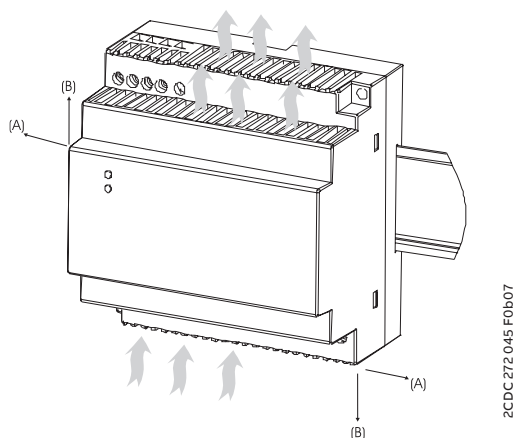
Demounting

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.

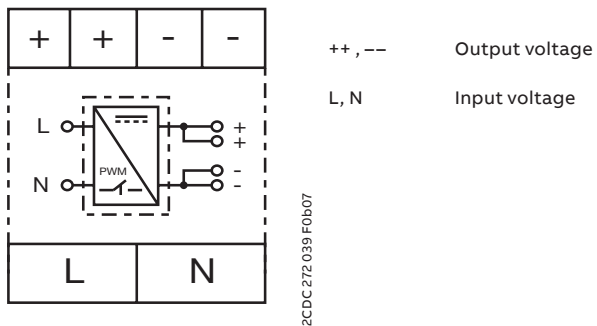


Electrical connection

Connect the input terminals L and N. The installation must be executed acc. to EN 62368-1, 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

**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 housing can become hot.
- The device contains no user serviceable parts. In any case of device malfunction please send the unit back to manufacturer.



The device must be installed by qualified persons only and in accordance with the specific national regulations (e. g. VDE, etc.).

The CP-D power supplies are chassis-mounted units. It is maintenance-free and does not contain any integral setting elements and should therefore not be opened.

**Before any installation, maintenance or modification work:**

- Read the operating and installation instructions carefully and completely!
- Disconnect the system from the supply network and protect against switching on!

**CAUTION**

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

**WARNING****Before start of operation the following must be ensured:**

- Connection to mains or DC supply according to the specific national regulations for class of protection I. 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 convection the distance to the other devices has to be considered.

**WARNING****Danger to life!**

Never carry out work when voltage is present. 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. If the internal fuse is blown most probably the device is defect. In this case an examination of the device by the manufacturer is necessary.

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	1800 mA / 117.3 W
	230 V AC	900 mA / 114.4 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. 30 A
	230 V AC	max. 60 A
Power failure buffering time		min. 60 ms
Internal input fuse (apparatus protection, not accessible)		3.15 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

Operating controls

Potentiometer - OUTPUT Adjust: Potentiometer	OUTPUT Adjust	Output adjustment
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Output circuits

Rated output voltage	++, --	24 V DC
Tolerance of the output voltage		$\pm 1\%$
Adjustment range of the output voltage		24–28 V DC
Rated output power		100 W
Rated output current I_r	$T_a \leq 60\text{ °C}$	4.2 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		35 V / 1 s
Characteristic curve of output		U/I characteristic curve
Short-circuit protection		continuous short-circuit stability
Short-circuit behaviour		continuation with output power limiting
Current limiting at short circuit		typ. 11.5 A
Overload protection		output power limiting
Overvoltage protection		30–33 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)		89.9 x 91 x 57.5 mm (3.54 x 3.58 x 2.26 inches)
Material of housing	housing	plastic
Efficiency		typ. 89 %
Weight		0.386 kg (0.72 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	0.2–2.5 mm ² (24-14 AWG)
		rigid 0.2–2.5 mm ² (24-12 AWG)
Stripping length		7 mm (0.28 in)
Tightening torque		0.7 Nm (6 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

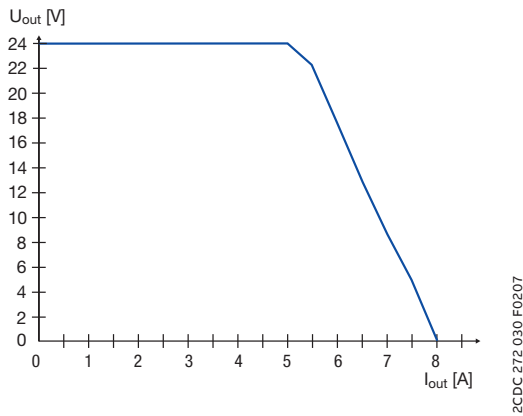
Standards	IEC/EN 62368-1
Low Voltage Directive	2014/35/EU
Protective low voltage	SELV (IEC 60950-1)
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

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



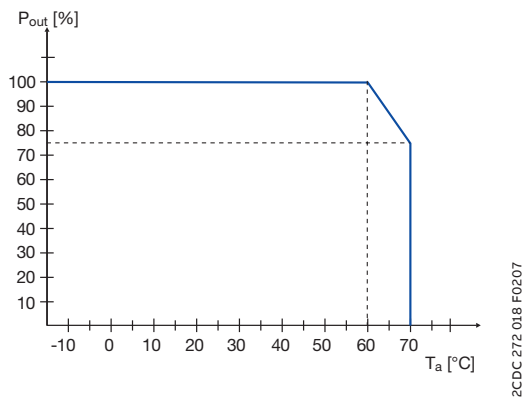
Characteristic curve of output at $T_a = 25\text{ °C}$

The switch mode power supply CP-D 24/4.2 is able to supply at 24 V DC output voltage and

- at an ambient temperature of:
 $\leq 60\text{ °C}$ a continuous output current of approx. 4.2 A
- at ambient temperatures of:
 $60\text{ °C} < T_a \leq 70\text{ °C}$ the output power has to be reduced by 2.5 % per °C temperature increase.

If the switch mode power supply is loaded with an output current $> 4.2\text{ A}$, the operating point is passing through the U/I characteristic curve shown.

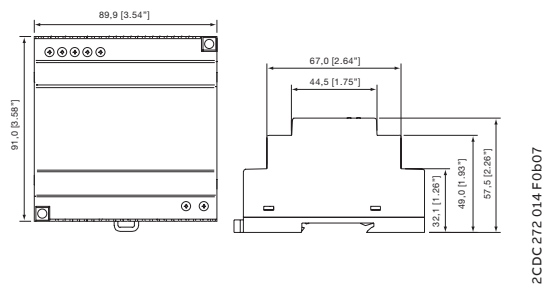
Temperature behaviour



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.

