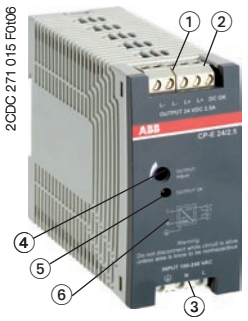
Power supply CP-E 24/2.5

Primary switch mode power supply

Data sheet



① OUTPUT L+, L-: terminals - output

② DC OK: terminal - signal output “output voltage OK”

③ INPUT L, N, PE: terminals - input

④ OUTPUT OK: green LED - output voltage OK

⑤ OUTPUT Adjust: rotary potentiometer - output voltage adjust

⑥ Circuit diagram

Features

- Rated output voltage 24 V DC
- Output voltage adjustable via front-face rotary potentiometer “OUTPUT Adjust”
- Rated output current 2.5 A
- Rated output power 60 W
- Wide range input 100-240 V AC (85-264 V AC, 90-375 V DC)
- Typical efficiency of 89 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -10...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Redundancy module CP-RUD offering true redundancy, available as accessory
- LEDs for status indication

Approvals

	UL 508, CAN/CSA C22.2 No.14	Approval refers to rated input voltage U_{IN}
	UL 1310, CAN/CSA C22.2 No.223 (Class 2 Power Supply)	
	ANSI/ISA-12.12 (Class I, Div. 2, hazardous locations)	pending
	UL 60950, CAN/CSA C22.2 No.60950	Approval refers to rated input voltage U_{IN}
	GOST	
	CCC	Approval refers to rated input voltage U_{IN}

Marks

CE	CE	
	C-Tick	pending

Order data

Type	Rated input voltage	Rated output voltage / current	Order code
CP-E 24/2.5	100-240 V AC	24 V DC / 2.5 A	1SVR 427 032 R0000

Order data - Accessories

Type	Description	Order code
CP-RUD	**Redundancy module** The CP-RUD monitors two CP-E range power supplies with an output current of up to 5 A each.	1SVR 423 418 R9000

Application

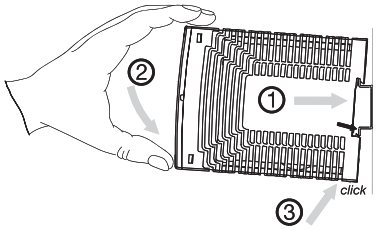
The primary switch mode power supply offers two voltage input ranges. This enables the supply with AC or DC. Furthermore it is equipped with two generous capacitors, which ensure mains buffering of at least 30 ms. That is why the devices can be used worldwide also in high fluctuating networks and battery-powered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

Operating mode

Adjustable output voltage

This device features a 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.

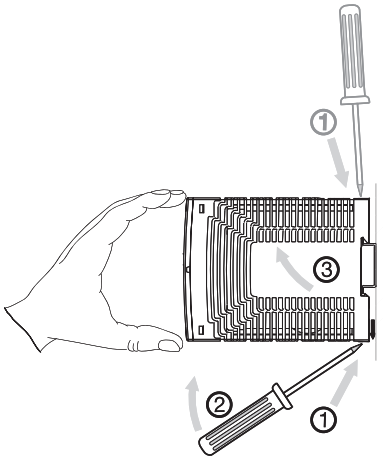
Installation



2CDC 272 057 F0206

Mounting

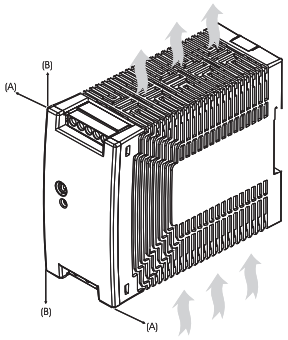
The switch mode power supply can be snapped on a DIN rail according to EN 50022 as shown in the accompanying picture. For that the device is set with its mounting rail slide on the upper edge of the mounting rail and locked by lifting it downwards.



2CDC 272 058 F0206

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.



2CDC 272 060 F0206

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 and horizontal direction.

Electrical connection

Connect the input terminals L and N. The protective earth conductor PE must be connected. 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 (considering the short-circuit 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. The device is overload, short-circuit and open-circuit proof. The secondary side of the power supply unit is electrically isolated from the input and internally not earthed (SELV) and can therefore be earthed by the user according to the needs with L+ or L- (PELV).

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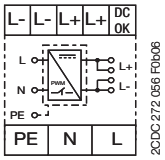
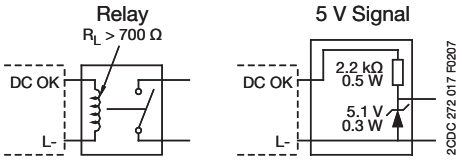
Connection diagram(s)



DC OK	Signal output “output voltage OK”
L+, L-	Output voltage
L, N	Input voltage
PE	Protective earth

Wiring instructions



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-E power supply units are chassis-mounted units. They are maintenance-free and do not contain any integral setting elements and should therefore not be opend.

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 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.
- The protective earth conductor must be connected to the terminal PE.
- 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 defective. 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.

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Technical data

Data at T_a = 25 °C, U_{IN} = 230 V AC and rated values, if nothing else indicated

Input circuits - Supply circuits		1SVR 427 032 R0000	
Rated input voltage U_{IN}	L, N	100-240 V AC	
Typical current / power consumption		110 V AC	230 V AC
	at 100-240 V AC	1080 mA / 69.4 W	570 mA / 69.0 W
Input voltage range	AC	85-264 V AC	
	DC	90-375 V DC	
Frequency range	AC	47-63 Hz	
	DC	0 Hz	
Inrush current		60 A max. 3 ms	
Power failure buffering time		min. 30 ms	
Internal input fuse (apparatus protection, not accessible)		2 A slow-acting / 250 V AC	

Indication of operational states		1SVR 427 032 R0000
Output voltage	OUTPUT OK: green LED	⎍: output voltage OK

Output circuits		1SVR 427 032 R0000
Rated output voltage	L+, L-	24 V DC
Tolerance of the output voltage		± 1 %
Adjustment range of the output voltage		24-28 V DC
Rated output power		60 W
Rated output current I_r	$T_a \leq 60$ °C	2.5 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C	2.5 %/K
Signal output	DC OK	yes
Deviation	load change statical	max. 0.5 %
	load change dynamical 10-90 %	-
	change of input voltage within the input voltage range	max. ± 1 %
Control time		< 2 ms
Starting time after applying supply voltage	at I_r	max. 1 s
Rise time	at rated load	max. 150 ms
Residual ripple and switching peaks	BW = 20 MHz	50 mV
Parallel connection		yes, to enable redundancy
Series connection		yes, to increase voltage
Resistance to reverse feed		approx. 35 V DC
Power factor correction (PFC)		no
Output curve		U/I curve
Short-circuit protection		continuous short-circuit stability
Short-circuit behaviour		continuation with current limitation
Overload protection		current limitation
No-load protection		continuous no-load stability
Starting of capacitive loads		unlimited

General data	1SVR 427 032 R0000
Duty time	100 %

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General data		1SVR 427 032 R0000
Dimensions (W x H x D)		43.5 x 88.5 x 115 mm (1.71 x 3.48 x 4.53 inches)
Material of enclosure		plastic
Efficiency		typ. 89 %
Weight		0.36 kg (0.79 lb)
Mounting position		horizontal
Minimum distance to other units		
normal operation mode	horizontal	25 mm (0.98 inch)
	vertical	25 mm (0.98 inch)
Mounting		DIN rail (EN 60715), snap-on mounting without any tool
Degree of protection	enclosure / terminals	IP20 / IP20
Class of protection		I

Electrical connection		1SVR 427 032 R0000
Input circuit / Output circuit		
Wire size	fine-strand with wire end ferrule	0.2-2.0 mm² (24-14 AWG)
	fine-strand without wire end ferrule	0.2-2.0 mm² (24-14 AWG)
	rigid	0.2-2.0 mm² (24-14 AWG)
Stripping length		6 mm (0.24 inches)
Tightening torque		0.5-0.6 Nm

Environmental data		1SVR 427 032 R0000
Ambient temperature range	operation	-10...+70 °C
	full load	-10...+60 °C
	storage	-25...+85 °C
Damp heat, cyclic (IEC/EN 60068-2-30)		4 x 24 cycle, 40 °C, 95 % RH
Vibration, sinusoidal (IEC/EN 60068-2-6)		10 m/s², 10...500 Hz
Shock, half-sine (IEC/EN 60068-2-27)		40 m/s², 22 ms, all directions

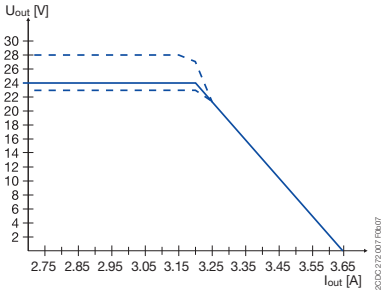
Isolation data		1SVR 427 032 R0000
Rated insulation voltage U_i	Input circuit / Output circuit	3 kV AC
Pollution degree		2

Standards / Directives	1SVR 427 032 R0000
Product standard	EN 61204
EMC Directive	2004/108/EC
Low Voltage Directive	2006/95/EC
RoHS Directive	2002/95/EC
Electrical safety	EN 50178, EN 60950-1, UL 60950-1, UL 508
Protective low voltage	SELV (EN 60950)

Electromagnetic compatibility		1SVR 427 032 R0000
Interference immunity		IEC/EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2	Level 4 (8 kV / 15 kV)
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	Level 3 (10 V/m)
fast transients (Burst)	IEC/EN 61000-4-4	Level 4 (4 kV)
powerful impulses (Surge)	IEC/EN 61000-4-5	Level 4 (2 kV / 4 kV)
HF line emission	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission		IEC/EN 61000-6-3
electromagnetic field (HF radiation resistance)	IEC/CISPR 22, EN 55022	Class B
HF line emission	IEC/CISPR 22, EN 55022	Class B

Technical diagrams

Output behavoiur



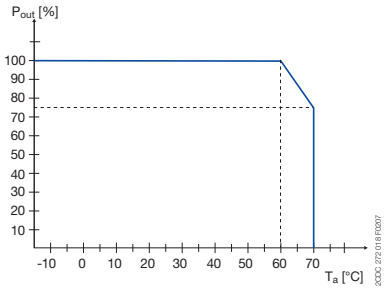
Output curve at T_a = 25 °C

The switch mode power supply CP-E 24/2.5 is able to supply at 24 V DC output voltage and

- at an ambient temperature of:
  ≤ 60 °C a continuous output current of approx. 2.5 A
- at ambient temperatures of:
  60 °C < T_a ≤ 70 °C the output power has to be reduced by 2,5 % per Kelvin temperature increase.

If the switch mode power supply is loaded with an output current > 2.5 A, the operating point is passing through the U/I characteristic curve shown.

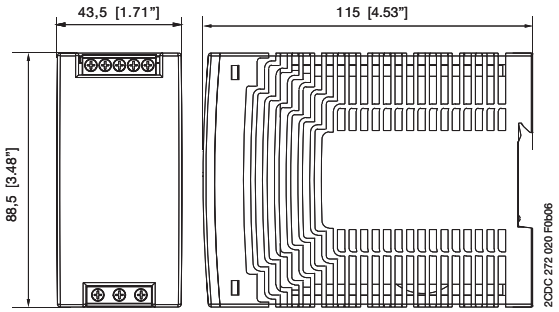
Temperature behaviour



Temperature curve at U_{OUT}

Dimensions

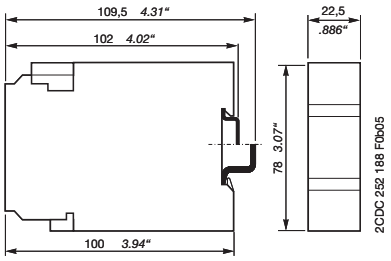
in mm



CP-E 24/2.5

Dimensions accessories

in mm



CP-RUD

Further Documentation

Document title	Document type	Document number
Electronic Products and Relays	Technical catalogue	2CDC 110 004 C020x
Power Supply Units	Application manual	2CDC 114 048 M0201
Redundancy module CP-RUD	Data sheet	2CDC 114 032 D0201

You can find the documentation in the internet under www.abb.com/lowvoltage → Control Products → ...

Document number: 2CDC 114 045 D0201 (11/2007)

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