Power supply CP-E 48/5.0

Primary switch mode power supply

Data sheet



① OUTPUT L+, L+, L-, L-: terminals - output

② INPUT L, N, PE: terminals - input

③ OUTPUT OK: green LED - output voltage OK

④ OUTPUT LOW: red LED - output voltage too low

⑤ OUTPUT Adjust: potentiometer - adjustment of the output voltage

⑥ single/parallel: sliding switch - adjustment of single or parallel operation

⑦ Circuit diagram

Features

- Rated output voltage 48 V DC
- Output voltage adjustable via front-face rotary potentiometer “OUTPUT Adjust”
- Rated output current 5 A
- Rated output power 240 W
- Supply range 115/230 V AC (90-132 V AC, 186-264 V AC, 210-370 V DC), auto select
- Typical efficiency of 90 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -25...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- LEDs for status indication

Approvals

	UL 508, CAN/CSA C22.2 No.14	Approval refers to rated input voltage U_{IN}
	UL 60950, CAN/CSA C22.2 No.60950	Approval refers to rated input voltage U_{IN}
	GOST	

Marks

CE	CE	
	C-Tick	pending

Order data

Type	Rated input voltage	Rated output voltage / current	Order code
CP-E 48/5.0	115/230 V AC auto select	48 V DC / 5 A	1SVR 427 034 R2000

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 (at 230 V AC). That is why the devices can be used worldwide also in high fluctuating networks and battery-powered plants.

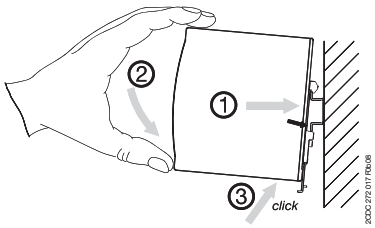
Operating mode

By means of the potentiometer „OUTPUT Adjust“ the output voltage can be adjusted within a range of 47 to 56 V DC. Thus, the power supply can be optimally adapted to the application, e.g. compensating the voltage drop caused by a long line length.

The green LED „OUTPUT OK“ is lightening during proper operation, i.e. when the output voltage is more than 75 %.

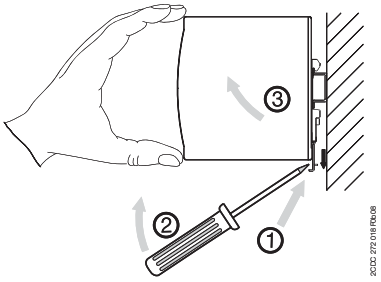
The red LED „OUTPUT LOW“ is lightening when the output voltage is less than 70 % of the rated output voltage.

Installation



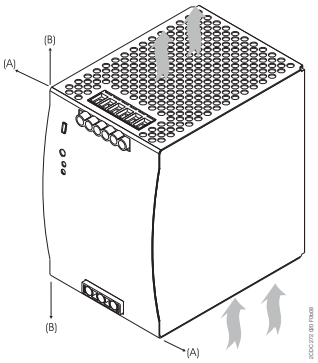
Mounting

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.



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 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.

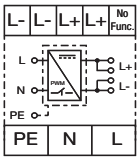
Rate the lines for the maximum output current (considering the short-circuit current) or provide a separate fuse protection. We recommend to choose the cable section as large as possible in order to minimize voltage drops. Observe the polarity. The device is overload, short-circuit and open-circuit proof. 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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Data sheet

Connection diagram



L+, L-	Output voltage
L, N	Input voltage
No function	not connected
PE	Protective earth

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.). The devices are maintenance-free chassis-mounted units.

Disconnect system from supply network!

Before any installation, maintenance or modification work: Disconnect the system from the supply network and protect against switching on.

Before start of operation:

Attention! Improper installation/operation may impair safety and cause operational difficulties or destruction of the unit. Before operation the following must be ensured:

- Connect to main according t 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.
- The protective earth conductor must be connected to the terminal (Protection class I)
- The secondary side of the power supply unit is not earthed and can be earthed by the user according to the needs with L+ or L-.
- Rate the output lines for the output current of the power supply and connect thme with the correct polarity.
- In order to ensure sufficient air-cooling the distance to other devices has to be considered.

In operation:

- Do not modify the installation (primary and secondary side)! High current! Risk of electric arcs and electric shocks (danger to life)!
- Risk of burns: Depending on the operation conditions the enclosure can become very hot.
- The internal fuse is not user-replaceable. 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! High voltage! Danger to life!



The power supplies contain 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.

Power supply CP-E 48/5.0

Primary switch mode power supply

Data sheet

Technical data

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

Type		**CP-E 48/5.0**
Input circuit		**L, N**
Rated input voltage U_{IN}		115/230 V AC auto select
Input voltage range		93-132 V AC, 186-264 V AC / 210-370 V DC
Frequency range AC		47-63 Hz
Typical input current	at 115 V AC	5.4 A
	at 230 V AC	2.2 A
Typical power consumption		267 W
Inrush current	at 115 V AC	30 A (max. 5 ms)
	at 230 V AC	60 A (max. 5 ms)
Power failure buffering	at 115 V AC	min. 25 ms
	at 230 V AC	min. 30 ms
Internal input fuse		6.3 A slow-acting / 250 V AC
Indication of operational states		
Output voltage	OUTPUT OK: green LED	⎍: output voltage OK
	OUTPUT LOW: red LED	⎍: output voltage too low
Output circuit		**L+, L+, L-, L-**
Rated output voltage		48 V DC
Tolerance of the output voltage		0...+1 %
Adjustment range of the output voltage		47-56 V DC
Rated output power		240 W
Rated output current I_r	$T_a \leq 60$ °C	5 A
Derating of the output current	60 °C < $T_a \leq$ 70 °C	2.5 %/°C
Maximum deviation with	load change statical	±1 % (single mode) ±5 % (parallel mode)
	change of input voltage within the input voltage range	±0.5 %
Control time		< 2 ms
Starting time after applying the supply voltage	at I_r	max. 1 s
Response time	at rated load	
Residual ripple and switching peaks	BW = 20 MHz	100 mV
Parallel connection		configurable, to increase power, up to 3 devices, reduction: (number of devices x I_r x) x 0.9
Series connection		yes, to increase voltage, max. 2 devices
Resistance to reverse feed		
Power factor correction (PFC)		yes
Output circuit - No-load, overload and short-circuit behaviour		
Output curve		U/I curve
Short-circuit protection		continuous short-circuit proof
Short-circuit behaviour		continuation with output power limitation
Overload protection		output power limitation
No-load protection		continuous no-load stability
Starting of capacitive loads		unlimited

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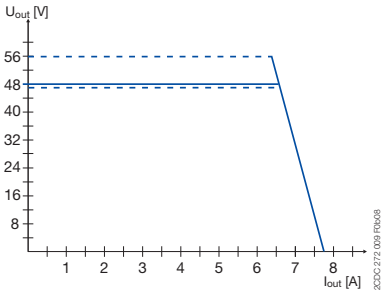
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Data sheet

Type		CP-E 48/5.0
Gerneral data		
Efficiency		typ. 90 %
Duty time		100 %
Dimensions (W x H x D)		83 x 123.6 x 123.6 mm [3.27 x 4.87 x 4.87 in]
Weight		1.36 kg (3.01 lb)
Material of enclosure		Metall
Mounting		DIN rail (EN 60715), snap-on mounting without any tool
Mounting position		horizontal
Minimum distance to other units	horizontal / vertical	25 mm / 25 mm (0.98 in / 0.98 in)
Degree of protection	enclosure / terminals	IP/20 / IP20
Protection class		I
Electrical connection - input circuit / output circuit		
Wire size	fine-strand with wire end ferrule	0.2-4 mm² (24-11 AWG)
	fine-strand without wire end ferrule	0.2-6 mm² (24-10 AWG)
	rigid	
Stripping length		8 mm (0.31 in)
Tightening torque	input / output	1 Nm / 0.6 Nm
Environmental data		
Ambient temperature range	operation	-25…+70 °C
	rated load	-25...60 °C
	storage	-25…+85 °C
Damp heat (cyclic) (IEC/EN 60068-2-30)		95 % without condensation
Vibration (sinusoidal) (IEC/EN 60068-2-6)		
Shock (half-sine) (IEC/EN 60068-2-27)		
Isolation data		
Rated insulation voltage U_i	input circuit / output circuit	3 kV AC
Pollution degree		2
Standards		
Product standard		
Low Voltage Directive		2006/95/EG
EMC directive		2004/108/EG
RoHS directive		2002/95/EG
Electrical safety		IEC/EN 60950-1
Protective low voltage		SELV
Electromagnetic compatibility		
Interference immunity		IEC/EN 61000-6-2
electrostatic discharge (ESD)	IEC/EN 61000-4-2	
electromagnetic field (HF radiation resistance)	IEC/EN 61000-4-3	
fast transients (Burst)	IEC/EN 61000-4-4	
powerful impulses (Surge)	IEC/EN 61000-4-5	
HF line emission	IEC/EN 61000-4-6	
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 behaviour



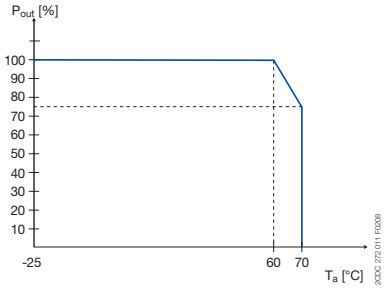
Output curve at T_a = 25 °C

The switch mode power supply CP-E 48/5.0 is able to supply at 48 V DC output voltage and

- at an ambient temperature of:
  ≤ 60 °C a continuous output current of approx. 5 A
- at ambient temperatures of:
  60 °C < T_a ≤ 70 °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 > 5 A, the operating point is passing through the U/I characteristic curve shown.

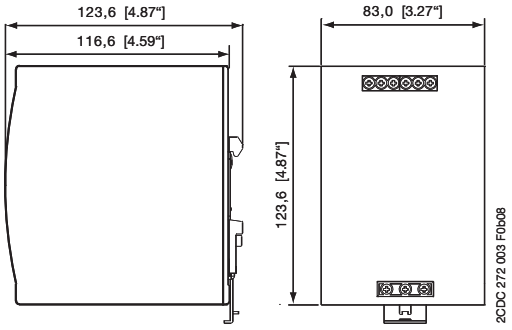
Temperature behaviour



Temperature curve at rated load

Dimensions

in mm



CP-E 48/5.0

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 M020x

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

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