The CP-E range offers enhanced functionality while the number of different types has been considerably reduced. Now all power supply units can be operated at an ambient temperature of up to +70 °C.

**Characteristics**
- 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, 180-264 V AC, 210-375 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 -40...+70 °C
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- LEDs for status indication

**Approvals**
- UL 508, CAN/CSA C22.2 No.107.1
- ANSI/ISA-12.12, CAN/CSA C22.2 No. 213 (Class I, Div. 2, hazardous locations)
- UL 60950, CAN/CSA C22.2 No.60950
- EAC
- CCC

1) Approval refers to rated input voltage \( U_{\text{in}} \).

**Marks**
- CE
- RCM

**Order data**

<table>
<thead>
<tr>
<th>Type</th>
<th>Input voltage range</th>
<th>Rated output voltage / current</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-E 48/5.0</td>
<td>90-132 V AC / 180-264 V AC 210-375 V DC</td>
<td>48 V DC / 5 A</td>
<td>1SVR 427 034 R2000</td>
</tr>
</tbody>
</table>
Functions

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

2. INPUT L, N, PE:
   terminals – input

3. OUTPUT LOW:
   red LED – output voltage too low

4. OUTPUT OK:
   green LED – output voltage OK

5. OUTPUT Adjust:
   potentiometer – adjustment of the output voltage

6. single/parallel:
   sliding switch – adjustment of single or parallel operation

7. Circuit diagram

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.

The red LED “OUTPUT LOW” is lightening when the output voltage is too low.

Switch “single/parallel” for selection of single or parallel operation.
**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 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).

Connection diagram

![Connection diagram](image-url)
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 to the specific national regulations.
– Power supply cables and unit must be sufficiently fused. A disconnecting device has to be provided for the power supply to disengage unit and supply cables from supply mains if required.
– The protective earth conductor must be connected to the terminal PE (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 them 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.
Technical data
Data at $T_a = 25 \, ^\circ\text{C}$, $U_n = 230 \, \text{V AC}$ and rated values, unless otherwise indicated

### Input circuits

<table>
<thead>
<tr>
<th>Supply circuits</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| Rated input voltage $U_n$ | L,N | 115 / 230 V AC
| Input voltage range | AC | 90-132 V, 180-264 V
| | DC | 210-375 V
| Frequency range | AC | 47-63 Hz
| Typical input current | at 115 V AC | 4 A
| | at 230 V AC | 1.55 A
| Typical power consumption | | 267 W
| Inrush current limiting | at 115 V AC | 30 A (max. 5 ms)
| | at 230 V AC | 60 A (max. 5 ms)
| Discharge current | input / output | 0.25 mA
| | input / PE | 3.5 mA
| Power failure buffering time | 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
| Power factor correction (PFC) | | yes, passive, 0.7

### User interface

#### Indication of operational states

| Output voltage | OUTPUT OK: green LED | L | output voltage OK
| OUTPUT LOW: red LED | L | output voltage too low

### Output circuit

| Rated output voltage | L+, L+, L-, L- | 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_0 | $T_a \leq 60 \, ^\circ\text{C}$ | 5 A
| Derating of the output current | $60 \, ^\circ\text{C} < T_a \leq 70 \, ^\circ\text{C}$ | 2.5 %/°C
| Maximum deviation with load change statical | ±1 % (single mode) | ±5 % (parallel mode)
| | change of output 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
| with 7000 µF | max. 1.5 s
| Rise time at $I_r$ with 7000 µF | max. 150 ms
| Fall time | max. 500 ms
| Residual ripple and switching peaks $BW = 20 \, \text{MHz}$ | 100 mV
| Parallel connection | configurable, to increase power, up to 3 devices, min. 0.1 $I_r$ – max. 0.9 $I_r$
| Series connection | yes, to increase voltage, max. 2 devices
| Resistance to reverse feed | max. 63 V DC
Output circuit – no-load, overload and short-circuit behaviour

| Characteristic curve of output | U/I characteristic curve |
| Short-circuit protection | continuous short-circuit proof |
| Short-circuit behaviour | continuation with output power limiting |
| Overload protection | output power limitation |
| No-load protection | continuous no-load stability |
| Starting of capacitive loads | unlimited |

General data

| Power dissipation | typ. 32 W |
| 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 | 1.322 kg (2.915 lb) |
| Material of housing | metal |
| Mounting | DIN rail (IEC/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 | housing / terminals IP20 / IP20 |
| Protection class | I |

Electrical connection – input circuit / output circuit

| Connecting capacity | fine-strand with wire end ferrule 0.2-4 mm² (24-11 AWG) |
| Stripping length | 8 mm (0.31 in) |
| Tightening torque | 1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in) |

Environmental data

| Ambient temperature range | operation -40...+70 °C (-40...+158 °F) |
| Damp heat | 95 % RH, without condensation |
| Vibration (sinusoidal) (IEC/EN 60068-2-6) | 10-500 Hz, 2 G, along X, Y, Z each axis, 60 min. for each axis |
| Shock (half-sine) (IEC/EN 60068-2-27) | 15 G, 11 ms, 3 axis, 6 faces, 3 times for each face |

Isolation data

| Rated insulation voltage Ui | input / output 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

<table>
<thead>
<tr>
<th>Interference immunity to</th>
<th>Standard</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>electrostatic discharge</td>
<td>IEC/EN 61000-4-2</td>
<td>Level 4 (air discharge 15 kV / contact discharge 8 kV)</td>
</tr>
<tr>
<td>radiated, radio-frequency, electromagnetic field</td>
<td>IEC/EN 61000-4-3</td>
<td>Level 3 (10 V/m)</td>
</tr>
<tr>
<td>electrical fast transient / burst</td>
<td>IEC/EN 61000-4-4</td>
<td>Level 4 (4 kV / 2.5 kHz)</td>
</tr>
<tr>
<td>surge</td>
<td>IEC/EN 61000-4-5</td>
<td>L-L Level 3 (2 kV) / L-PE Level 4 (4 kV)</td>
</tr>
<tr>
<td>conducted disturbances, induced by radio-frequency fields</td>
<td>IEC/EN 61000-4-6</td>
<td>Level 3 (10 V)</td>
</tr>
<tr>
<td>power frequency magnetic fields</td>
<td>IEC/EN 61000-4-8</td>
<td>Level 4 (30 A/m)</td>
</tr>
<tr>
<td>voltage dips, short interruptions and voltage variations</td>
<td>IEC/EN 61000-4-11</td>
<td>dip: &gt;95 % 10 ms / &gt;30 % 500 ms, interruptions: &gt;95 % 5000 ms</td>
</tr>
<tr>
<td>Interference emission</td>
<td>IEC/EN 61000-6-3</td>
<td></td>
</tr>
<tr>
<td>high-frequency radiated</td>
<td>IEC/CISPR 22, EN 55022</td>
<td>Class B</td>
</tr>
<tr>
<td>high-frequency conducted</td>
<td>IEC/CISPR 22, EN 55022</td>
<td>Class B</td>
</tr>
<tr>
<td>limits for harmonic current emissions</td>
<td>IEC/EN 61000-3-2</td>
<td>Class D</td>
</tr>
</tbody>
</table>
Technical diagrams

Output behaviour

Characteristic curve of output 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:
  - $\leq 60$ °C a continuous output current of approx. 5 A
  - at ambient temperatures of:
    - $60$ °C < $T_a \leq 70$ °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

Characteristic curve of temperature at rated load

Dimensions

in mm [inches]
Further documentation

<table>
<thead>
<tr>
<th>Document title</th>
<th>Document type</th>
<th>Document number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Products and Relays</td>
<td>Technical catalogue</td>
<td>2CDC 110 004 C02xx</td>
</tr>
<tr>
<td>Power Supply Units</td>
<td>Application manual</td>
<td>2CDC 114 048 M020x</td>
</tr>
</tbody>
</table>

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.
You can find the address of your local sales organisation on the ABB home page
http://www.abb.com/contacts
-> Low Voltage Products and Systems

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