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# Power supplies

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# Primary switch mode power supplies

## Overview

Modern power supply units are a vital component in energy management and automation technology. As your global partner in these areas, ABB pays the utmost attention to the resulting requirements. Innovation is the key to ABB's power supply product program.

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### Power supplies for industrial applications



#### CP-E range: economy range

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. The CP-E range 24 V devices over 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis. Optimized for worldwide applications, the CP-E power supplies can be supplied within a wide range of AC or DC voltages. The output voltage is continuously adjustable, ensuring optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length. For decoupling of parallel connected power supplies below or equal to 56 V, redundancy modules are available in order to achieve true redundancy.



#### CP-T range: three-phase range

The CP-T range of three-phase power supply units perfectly complements ABB's existing power supply offering in terms of design and functionality, giving you more advanced options for your three-phase applications. Solid state output for function monitoring and remote diagnostics is available. The range is to be used in 340 - 575 V AC or 480 - 820 V DC supply systems. Its continuously adjustable output voltage ensures optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length.



#### CP-C.1 range: high-performance range

The CP-C.1 power supplies are ABB's high-performance and most advanced range. With excellent efficiency, high reliability and innovative functionality, the CP-C.1 range is ready to take on the most demanding industrial applications. These power supplies have a 150 % integrated power reserve and operate at an efficiency of up to 94 %. They are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, the CP-C.1 power supplies are the preferred choice for professional DC applications. Giving the power to control.

# Primary switch mode power supplies

## Overview

### Power supplies for industrial applications



#### CP-B range: short time buffers

ABB offers an innovative and completely maintenance-free product range for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

- Ultra cap based buffer modules for short time UPS systems
- Rated input voltage 24 V DC
- Rated currents 3 A, 10 A and 20 A
- Expandable with CP-B EXT.2 module
- LEDs for status indication
- Higher than 90% efficiency
- Signaling and status outputs
- Buffering times at 100 % load current from 13 s to 38 s (depending on device)

### Power supplies for building applications



#### CP-D range: distribution panel design

The CP-D range of power supply units in MDRC design (modular DIN rail components) fits into all domestic installation and distribution panels. With their width of only 18 to 90 mm, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels. The range is optimized for worldwide applications: The CP-D power supplies can be supplied with 90-264 V AC or 120-375 V DC. The continuously adjustable output voltage (CP-D > 10 W) ensures optimal adaption to the application, e.g. compensating the voltage drop caused by a long line length. An additional redundancy unit CP-RUD to establish true redundancy is available.



For certifications and approvals, please refer to the download section on the product web pages.



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pas = passive, act = active

# Primary switch mode power supplies

## Selection table - Three-phase

|                        |                             | Order number | 1SVR427054R0000 | 1SVR427055R0000 | 1SVR427056R0000 | 1SVR427057R0000 | 1SVR427054R2000 | 1SVR427055R2000 | 1SVR427056R2000 |
|------------------------|-----------------------------|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                        |                             | Three-phase  |                 |                 |                 |                 |                 |                 |                 |
|                        |                             | CP-T         |                 |                 |                 |                 |                 |                 |                 |
| Rated output voltage   | 24 V DC                     | ■            | ■               | ■               | ■               |                 |                 |                 |                 |
|                        | 48 V DC                     |              |                 |                 |                 | ■               | ■               | ■               |                 |
| Rated output current   | 5 A                         | ■            |                 |                 |                 | ■               |                 |                 |                 |
|                        | 10 A                        |              | ■               |                 |                 |                 | ■               |                 |                 |
|                        | 20 A                        |              |                 | ■               |                 |                 |                 |                 | ■               |
|                        | 40 A                        |              |                 |                 | ■               |                 |                 |                 |                 |
| Rated output power     | 120 W                       | ■            |                 |                 |                 |                 |                 |                 |                 |
|                        | 240 W                       |              | ■               |                 |                 | ■               |                 |                 |                 |
|                        | 480 W                       |              |                 | ■               |                 |                 | ■               |                 |                 |
|                        | 960 W                       |              |                 |                 | ■               |                 |                 |                 | ■               |
| Rated input voltage    | 3 x 400-500 V AC            | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
| DC input voltage range | 480-820 V DC                | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
| Features               | Adjustable output voltage   | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
|                        | Integrated input fuse       | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
|                        | Short-circuit stable        | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
|                        | Fold forward behavior (U/I) | ■            | ■               | ■               |                 | ■               | ■               |                 |                 |
|                        | Fold back behavior (hiccup) | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
|                        | Extended temp. range        | ■            | ■               | ■               | ■               | ■               | ■               | ■               | ■               |
|                        | Signalling contact          | ■            | ■               | ■               | ■               |                 |                 |                 |                 |
|                        | Parallel connection         |              | 2               | 2               | 2               | 2               | 2               | 2               | 2               |
|                        | Serial connection           |              | 2               | 2               | 2               | 2               | 2               | 2               | 2               |



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## Power supplies for industrial applications

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## CP-E range

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## CP-E range

### Benefits and advantages



ABB's CP-E range offers enhanced functionality and a simpler, more rational selection process. All power supply units can be operated at an ambient temperature of up to +70 °C (158 °F).



**Affordable range**

Products with exactly the functions you require.  
Designed for best possible price-performance ratio.



**Global availability**

The product can be used in any installations in the world. Giving you the confidence of worldwide sourcing – no matter where you build, install or operate your equipment.



**Speed up your projects**

Data available for common planning software: Less engineering time required.

## CP-E range

### Benefits and advantages



#### Characteristics

- Output voltages 5 V, 12 V, 24 V, 48 V DC
- Adjustable output voltages
- Output currents 0.625 A / 0.75 A / 1.25 A / 2.5 A / 3 A / 5 A / 10 A / 20 A
- Power range 15 W, 18 W, 30 W, 60 W, 120 W, 240 W, 480 W
- High efficiency, up to 90 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- U/I characteristic curve on devices > 18 W (fold-forward behavior at overload – no switch-off)
- Redundancy units offering true redundancy
- LED(s) for status indication
- Signalling output/contact for output voltage OK
  - Transistor on 24 V devices > 18 W and < 120 W
  - Solid-state on 24 V devices ≥ 120 W
- Various approvals and marks



#### Main benefits

##### Signalling output / contact

The CP-E range 24 V devices > 18 W offer an output/contact for monitoring of the output voltage and remote diagnosis.

##### Wide range input

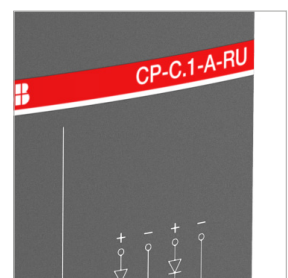
Optimized for worldwide applications: The CP-E power supplies can be supplied with a wide range of AC or DC voltages.

##### Adjustable output voltage

A continuously adjustable output voltage ensures optimal adaptation to the application, e.g. compensating the voltage drop caused by a long line length.

##### Redundancy units

For decoupling of parallelized power supply units ≤ 40 A. Thus, true redundancy can be achieved.



## CP-E range

### Operating controls

**OUTPUT Adjust:**  
Potentiometer -  
adjustment of  
output voltage

**Single/parallel:**  
Sliding switch -  
adjustment of  
single or parallel  
operation

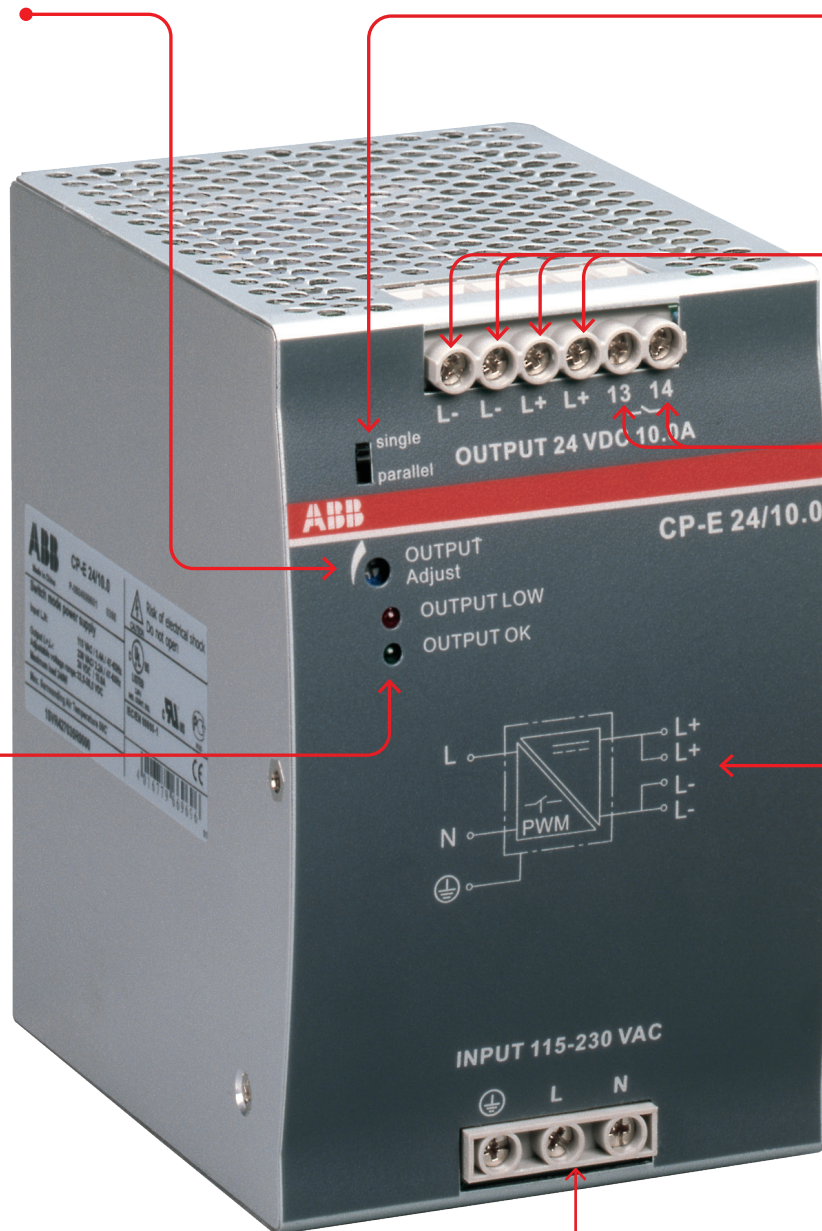
**OUTPUT**  
**L+, L+, L-, L-:**  
Terminals - output  
5 V / 12 V / 24 V /  
48 V

**13-14:**  
Terminals -  
signalling contact  
(or solid-state)

**Indication of  
operational states:**  
OUTPUT OK:  
green LED - output  
voltage OK  
OUTPUT LOW:  
red LED - output  
voltage too low

**Circuit diagram**

**INPUT L, N, PE:**  
**terminals - input**  
90-132 V AC, 180-265 V AC / 210-375 V DC  
90-264 V AC / 120-375 V DC  
85-264 V AC / 90-375 V DC





## CP-E range

### Applications



Tooling  
machines



Packaging  
industry



Food  
industry



Textile  
industry



Printing  
industry



Electro-  
mobility



## CP-E range

### Ordering details



2CDC 271 017 F0006

CP-E 5/0.75



2CDC 271 013 F0006

CP-E 12/2.5



2CDC 271 028 F0008

CP-E 48/5.0



2CDC 271 027 F0008

CP-E 24/20.0

#### Description

This range offers types with output voltages from 5 V DC to 48 V DC at output currents of 0.625 A to 20 A. With their high thermal efficiency of up to 90 %, these power supplies have very low power and heat dissipation and can be operated without forced cooling. The functionality has been enhanced while the number of different types has been considerably reduced. Of course, all power supplies of the CP-E range are approved in accordance with all relevant international standards.

#### Ordering details - CP-E < 100 W

| Input voltage range                      | Rated output voltage / current | Type         | Order code      | Weight (1 pc.)<br>kg (lb) |
|------------------------------------------|--------------------------------|--------------|-----------------|---------------------------|
| 90-264 V AC / 120-375 V DC               | 5 V DC / 3 A                   | CP-E 5/3.0   | 1SVR427033R3000 | 0.15<br>(0.33)            |
| 85-264 V AC / 90-375 V DC                | 12 V DC / 2.5 A                | CP-E 12/2.5  | 1SVR427032R1000 | 0.29<br>(0.64)            |
| 90-132 V AC, 180-264 V AC / 210-375 V DC | 12 V DC / 10 A                 | CP-E 12/10.0 | 1SVR427035R1000 | 1.00<br>(2.20)            |
| 90-264 V AC / 120-375 V DC               | 24 V DC / 0.75 A               | CP-E 24/0.75 | 1SVR427030R0000 | 0.15<br>(0.33)            |
| 85-264 V AC / 90-375 V DC                | 24 V DC / 1.25 A               | CP-E 24/1.25 | 1SVR427031R0000 | 0.29<br>(0.64)            |
| 85-264 V AC / 90-375 V DC                | 24 V DC / 2.5 A                | CP-E 24/2.5  | 1SVR427032R0000 | 0.36<br>(0.79)            |

#### Ordering details - CP-E ≥ 120 W

| Input voltage range                      | Rated output voltage / current | Type         | Order code      | Weight (1 pc.)<br>kg (lb) |
|------------------------------------------|--------------------------------|--------------|-----------------|---------------------------|
| 90-132 V AC, 180-264 V AC / 210-375 V DC | 24 V DC / 5 A                  | CP-E 24/5.0  | 1SVR427034R0000 | 1.00<br>(2.20)            |
| 90-132 V AC, 180-264 V AC / 210-375 V DC | 24 V DC / 10 A                 | CP-E 24/10.0 | 1SVR427035R0000 | 1.36<br>(3.01)            |
| 90-264 V AC / 120-375 V DC               | 24 V DC / 20 A                 | CP-E 24/20.0 | 1SVR427036R0000 | 1.90<br>(4.18)            |
| 85-264 V AC / 90-375 V DC                | 48 V DC / 0.625 A              | CP-E 48/0.62 | 1SVR427030R2000 | 0.29<br>(0.64)            |
| 85-264 V AC / 90-375 V DC                | 48 V DC / 1.25 A               | CP-E 48/1.25 | 1SVR427031R2000 | 0.36<br>(0.79)            |
| 90-132 V AC, 180-264 V AC / 210-375 V DC | 48 V DC / 5 A                  | CP-E 48/5.0  | 1SVR427034R2000 | 1.36<br>(3.01)            |
| 90-264 V AC / 120-375 V DC               | 48 V DC / 10 A                 | CP-E 48/10.0 | 1SVR427035R2000 | 1.90<br>(4.19)            |



## CP-E range

### Technical data

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

| Type                                                          |                                                            | CP-E 5/3.0                                                                                                           | CP-E 12/2.5                                                                                                             | CP-E 12/10.0                                                                                                                  |
|---------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Input circuit                                                 |                                                            | L, N                                                                                                                 |                                                                                                                         |                                                                                                                               |
| Rated input voltage U <sub>in</sub>                           |                                                            | 100-240 V AC                                                                                                         |                                                                                                                         | 115 / 230 V AC<br>auto select                                                                                                 |
| Input voltage range                                           |                                                            | 90-264 V AC /<br>120-375 V DC                                                                                        | 85-264 V AC /<br>90-375 V DC                                                                                            | 90-132 V AC,<br>180-264 V AC /<br>210-375 V DC                                                                                |
| Frequency range AC                                            |                                                            | 47-63 Hz                                                                                                             |                                                                                                                         |                                                                                                                               |
| Typical input current                                         | at 115 V AC                                                | 335 mA                                                                                                               | 560 mA                                                                                                                  | 2.2 A                                                                                                                         |
|                                                               | at 230 V AC                                                | 210 mA                                                                                                               | 330 mA                                                                                                                  | 0.83 A                                                                                                                        |
| Typical power consumption                                     |                                                            | 19.8 W                                                                                                               | 35.9 W                                                                                                                  | 143 W                                                                                                                         |
| Inrush current                                                | at 115 V AC                                                | 15 A                                                                                                                 | 20 A                                                                                                                    | 24 A                                                                                                                          |
|                                                               | at 230 V AC                                                | 30 A                                                                                                                 | 40 A                                                                                                                    | 48 A                                                                                                                          |
| Discharge current                                             | input / output                                             | 0.25 mA                                                                                                              |                                                                                                                         |                                                                                                                               |
|                                                               | input / PE                                                 | 3.5 mA                                                                                                               |                                                                                                                         |                                                                                                                               |
| Power failure buffering time                                  | at 115 V AC                                                | min. 20 ms                                                                                                           | min. 20 ms                                                                                                              | min. 25 ms                                                                                                                    |
|                                                               | at 230 V AC                                                | min. 75 ms                                                                                                           | min. 30 ms                                                                                                              | min. 30 ms                                                                                                                    |
| Internal input fuse                                           |                                                            | 2 A slow-acting / 250 V AC                                                                                           |                                                                                                                         | 3.15 A slow-acting /<br>250 V AC                                                                                              |
| Power factor correction (PFC)                                 |                                                            | no                                                                                                                   |                                                                                                                         | yes, passive, 0.7                                                                                                             |
| Indication of operational states                              |                                                            |                                                                                                                      |                                                                                                                         |                                                                                                                               |
| Output voltage                                                | green LED                                                  | OK:  :<br>output voltage OK       | OUTPUT OK:  :<br>output voltage OK | OUTPUT OK:  :<br>output voltage OK       |
|                                                               | red LED                                                    | LOW:  :<br>output voltage too low | -                                                                                                                       | OUTPUT LOW:  :<br>output voltage too low |
| Output circuit                                                |                                                            | L+, L-                                                                                                               | L+, L+, L-, L-                                                                                                          |                                                                                                                               |
| Rated output voltage                                          |                                                            | 5 V DC                                                                                                               | 12 V DC                                                                                                                 |                                                                                                                               |
| Tolerance of the output voltage                               |                                                            | 0...+1 %                                                                                                             |                                                                                                                         |                                                                                                                               |
| Adjustment range of the output voltage                        |                                                            | 4.5-5.75 V DC                                                                                                        | 12-14 V DC                                                                                                              | 11.4-14.5 V DC                                                                                                                |
| Rated output power                                            |                                                            | 15 W                                                                                                                 | 30 W                                                                                                                    | 120 W                                                                                                                         |
| Rated output current I <sub>r</sub>                           | T <sub>a</sub> ≤ 60 °C                                     | 3.0 A                                                                                                                | 2.5 A                                                                                                                   | 10 A                                                                                                                          |
|                                                               | 60 °C < T <sub>a</sub> ≤ 70 °C                             | 2.5 %/°C                                                                                                             | 2.5 %/°C                                                                                                                |                                                                                                                               |
| Maximum deviation with                                        | load change statical                                       | ±2 %                                                                                                                 | ±0.5 %                                                                                                                  | ±1 % (single mode)<br>±5 % (parallel mode)                                                                                    |
|                                                               | change of output voltage<br>within the input voltage range | ±1 %                                                                                                                 | ±0.5 %                                                                                                                  | ±0.5 %                                                                                                                        |
| Recovery time T <sub>R</sub>                                  |                                                            | < 2 ms                                                                                                               |                                                                                                                         |                                                                                                                               |
| Starting time after applying the supply voltage               | at I <sub>r</sub>                                          | max. 1 s                                                                                                             |                                                                                                                         |                                                                                                                               |
|                                                               | with 3500 µF                                               | -                                                                                                                    | max. 2 s                                                                                                                | -                                                                                                                             |
|                                                               | with 7000 µF                                               | max. 1.5 s                                                                                                           | -                                                                                                                       | max. 1.5 s                                                                                                                    |
| Rise time                                                     | at rated load                                              | max. 150 ms                                                                                                          |                                                                                                                         |                                                                                                                               |
|                                                               | with 3500 µF                                               | -                                                                                                                    | max. 500 ms                                                                                                             | -                                                                                                                             |
|                                                               | with 7000 µF                                               | max. 500 ms                                                                                                          | -                                                                                                                       | max. 500 ms                                                                                                                   |
| Fall time                                                     |                                                            | max. 150 ms                                                                                                          |                                                                                                                         |                                                                                                                               |
| Residual ripple and switching peaks                           |                                                            | BW = 20 MHz<br>50 mV                                                                                                 |                                                                                                                         |                                                                                                                               |
| Parallel connection                                           |                                                            | yes, to enable redundancy                                                                                            |                                                                                                                         | configurable, to increase<br>power, up to 3 devices,<br>min. 0.1 I <sub>r</sub> - max. 0.9 I <sub>r</sub>                     |
| Series connection                                             |                                                            | yes, to increase voltage                                                                                             |                                                                                                                         | yes, to increase<br>voltage, max. 2 devices                                                                                   |
| Resistance to reverse feed                                    |                                                            | 1 s - max. 7.5 V DC                                                                                                  | 1 s - max. 18 V DC                                                                                                      | max. 18 V DC                                                                                                                  |
| Output circuit - No-load, overload and short-circuit behavior |                                                            |                                                                                                                      |                                                                                                                         |                                                                                                                               |
| Characteristic curve of output                                |                                                            | hiccup-mode                                                                                                          | U/I characteristic curve                                                                                                |                                                                                                                               |
| Short-circuit protection                                      |                                                            | continuous short-circuit proof                                                                                       |                                                                                                                         |                                                                                                                               |
| Short-circuit behavior                                        |                                                            | Hiccup-mode                                                                                                          | continuation with output power limiting                                                                                 |                                                                                                                               |
| Overload protection                                           |                                                            | output power limiting                                                                                                |                                                                                                                         |                                                                                                                               |
| No-load protection                                            |                                                            | continuous no-load stability                                                                                         |                                                                                                                         |                                                                                                                               |
| Starting of capacitive loads                                  |                                                            | 7000 µF                                                                                                              | 3500 µF                                                                                                                 | 7000 µF                                                                                                                       |

## CP-E range

### Technical data

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

| Type                                                      |                                      | CP-E 5/3.0                                                      | CP-E 12/2.5            | CP-E 12/10.0                           |
|-----------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------|------------------------|----------------------------------------|
| General data                                              |                                      |                                                                 |                        |                                        |
| Power loss                                                |                                      | typ. 5 W                                                        | typ. 5.6 W             | typ. 24 W                              |
| Efficiency                                                |                                      | typ. 75 %                                                       | typ. 84 %              | typ. 84 %                              |
| Duty cycle                                                |                                      | 100 %                                                           |                        |                                        |
| Dimensions                                                |                                      | see “Dimensional drawings”                                      |                        |                                        |
| Material of housing                                       |                                      | plastic                                                         |                        | 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    | 0.2-2.5 mm2 (24-14 AWG)                                         |                        | 0.2-4 mm² (24-11 AWG)                  |
|                                                           | fine-strand without wire end ferrule |                                                                 |                        | 0.2-6 mm² (24-10 AWG)                  |
|                                                           | rigid                                |                                                                 |                        |                                        |
| Stripping length                                          |                                      | 6 mm (0.24 in)                                                  |                        | 8 mm (0.31 in)                         |
| Tightening torque                                         | input / output                       | 0.6 Nm (5 lb.in)                                                |                        | 1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in) |
| Environmental data                                        |                                      |                                                                 |                        |                                        |
| Ambient temperature range                                 | operation                            | -20...+70 °C                                                    | -40...+70 °C           | -35...+70 °C                           |
|                                                           | rated load                           | -20...+60 °C                                                    | -40...+60 °C           | -35...+60 °C                           |
|                                                           | storage                              | -20...+85 °C                                                    | -40...+85 °C           | -40...+85 °C                           |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                    |                                      | 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 axes, 6 faces, 3 times for each face             |                        |                                        |
| Isolation data                                            |                                      |                                                                 |                        |                                        |
| Rated insulation voltage U <sub>i</sub>                   | input circuit / output circuit       | 3 kV AC                                                         |                        |                                        |
|                                                           | input / PE                           | 1.5 kV AC                                                       |                        |                                        |
|                                                           | output / PE                          | 0.5 kV AC; 0.71 kV DC                                           |                        |                                        |
| Pollution degree                                          |                                      | 2                                                               |                        |                                        |
| Overvoltage category                                      |                                      | II                                                              |                        |                                        |
| Standards / Directives                                    |                                      |                                                                 |                        |                                        |
| Standards                                                 |                                      | IEC/EN 60950-1                                                  |                        |                                        |
| Low Voltage Directive                                     |                                      | 2014/35/EU                                                      |                        |                                        |
| EMC Directive                                             |                                      | 2014/30/EU                                                      |                        |                                        |
| RoHS Directive                                            |                                      | 2011/65/EU                                                      |                        |                                        |
| Protective low voltage                                    |                                      | SELV (IEC/EN 60950-1)                                           |                        |                                        |
| Electromagnetic compatibility                             |                                      |                                                                 |                        |                                        |
| Interference immunity to                                  |                                      | IEC/EN 61000-6-2                                                |                        |                                        |
| electrostatic discharge                                   | IEC/EN 61000-4-2                     | level 4 (air discharge 15 kV / contact discharge 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 / 2,5 kHz)                                        | level 4 (4 kV / 5 kHz) |                                        |
| surge                                                     | IEC/EN 61000-4-5                     | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                        |                        |                                        |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6                     | level 3 (10 V)                                                  |                        |                                        |
| power frequency magnetic fields                           | IEC/EN 61000-4-8                     | level 4 (30 A/m)                                                |                        |                                        |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11                    | dip: >95 % 10 ms / >30 % 500 ms<br>interruptions: >95 % 5000 ms |                        |                                        |
| Interference emission                                     |                                      | IEC/EN 61000-6-3                                                |                        |                                        |
| high-frequency radiated                                   |                                      | class B                                                         |                        |                                        |
| high-frequency conducted                                  |                                      | class B                                                         |                        |                                        |
| limits for harmonic current emissions                     | IEC/EN 61000-3-2                     | class D                                                         | class A                | class D                                |



## CP-E range

### Technical data

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

| Type                                                          |                                                            | CP-E 24/0.75                                                                                                         | CP-E 24/1.25                                                                                                       | CP-E 24/2.5 |
|---------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-------------|
| Input circuit                                                 |                                                            | L, N                                                                                                                 |                                                                                                                    |             |
| Rated input voltage U <sub>in</sub>                           |                                                            | 100-240 V AC                                                                                                         |                                                                                                                    |             |
| Input voltage range                                           |                                                            | 90-264 V AC /<br>120-375 V DC                                                                                        | 85-264 V AC /<br>90-375 V DC                                                                                       |             |
| Frequency range AC                                            |                                                            | 47-63 Hz                                                                                                             |                                                                                                                    |             |
| Typical input current                                         | at 115 V AC                                                | 335 mA                                                                                                               | 560 mA                                                                                                             | 1060 mA     |
|                                                               | at 230 V AC                                                | 210 mA                                                                                                               | 330 mA                                                                                                             | 590 mA      |
| Typical power consumption                                     |                                                            | 22.8 W                                                                                                               | 36.7 W                                                                                                             | 69.2 W      |
| Inrush current                                                | at 115 V AC                                                | 15 A                                                                                                                 | 20 A (max. 3 ms)                                                                                                   | 30 A        |
|                                                               | at 230 V AC                                                | 30 A                                                                                                                 | 40 A (max. 3 ms)                                                                                                   | 60 A        |
| Discharge current                                             | input / output                                             | 0.25 mA                                                                                                              |                                                                                                                    |             |
|                                                               | input / PE                                                 | 3.5 mA                                                                                                               |                                                                                                                    |             |
| Power failure buffering time                                  | at 115 V AC                                                | min. 20 ms                                                                                                           | min. 20 ms                                                                                                         |             |
|                                                               | at 230 V AC                                                | min. 75 ms                                                                                                           | min. 30 ms                                                                                                         |             |
| Internal input fuse                                           |                                                            | 2 A slow-acting / 250 V AC                                                                                           |                                                                                                                    |             |
| Power factor correction (PFC)                                 |                                                            | no                                                                                                                   |                                                                                                                    |             |
| Indication of operational states                              |                                                            |                                                                                                                      |                                                                                                                    |             |
| Output voltage                                                | green LED                                                  | OK:  :<br>output voltage OK         | OUTPUT OK:  : output voltage OK |             |
|                                                               | red LED                                                    | LOW:  :<br>output voltage too low | -                                                                                                                  | -           |
| Output circuit                                                |                                                            | L+,L-                                                                                                                | L+, L+, L-, L-                                                                                                     |             |
| Rated output voltage                                          |                                                            | 24 V DC                                                                                                              |                                                                                                                    |             |
| Tolerance of the output voltage                               |                                                            | 0 ... +1 %                                                                                                           |                                                                                                                    |             |
| Adjustment range of the output voltage                        |                                                            | 21.6-28.8 V DC                                                                                                       | 24-28 V DC                                                                                                         |             |
| Rated output power                                            |                                                            | 18 W                                                                                                                 | 30 W                                                                                                               | 60 W        |
| Rated output current I <sub>r</sub>                           | T <sub>a</sub> ≤ 60 °C                                     | 0.75 A                                                                                                               | 1.25 A                                                                                                             | 2.5 A       |
| Derating of the output current                                | 60 °C < T <sub>a</sub> ≤ 70 °C                             | 2.5 %/°C                                                                                                             |                                                                                                                    |             |
| Signalling output for output voltage OK                       | DC OK                                                      | -                                                                                                                    | transistor                                                                                                         |             |
| Maximum deviation with                                        | load change statical                                       | ±2 %                                                                                                                 | ±0.5 %                                                                                                             |             |
|                                                               | change of output voltage<br>within the input voltage range | ±1 %                                                                                                                 | ±0.5 %                                                                                                             |             |
| Recovery time T <sub>A</sub>                                  |                                                            | < 2 ms                                                                                                               |                                                                                                                    |             |
| Starting time after applying the supply voltage               | at I <sub>r</sub>                                          | max. 1 s                                                                                                             |                                                                                                                    |             |
|                                                               | with 3500 µF                                               | -                                                                                                                    | max. 2 s                                                                                                           | -           |
|                                                               | with 7000 µF                                               | max. 1.5 s                                                                                                           | -                                                                                                                  | max. 1.5 s  |
| Rise time                                                     | at rated load                                              | max. 150 ms                                                                                                          |                                                                                                                    |             |
|                                                               | with 3500 µF                                               | -                                                                                                                    | max. 500 ms                                                                                                        | -           |
|                                                               | with 7000 µF                                               | max. 500 ms                                                                                                          | -                                                                                                                  | max. 500 ms |
| Fall time                                                     |                                                            | 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                                    |                                                            | 1 s - max. 35 V DC                                                                                                   |                                                                                                                    |             |
| Output circuit - No-load, overload and short-circuit behavior |                                                            |                                                                                                                      |                                                                                                                    |             |
| Characteristic curve of output                                |                                                            | hiccup-mode                                                                                                          | U/I characteristic curve                                                                                           |             |
| Short-circuit protection                                      |                                                            | continuous short-circuit proof                                                                                       |                                                                                                                    |             |
| Short-circuit behavior                                        |                                                            | hiccup-mode                                                                                                          | continuation with output power limiting                                                                            |             |
| Overload protection                                           |                                                            | output power limiting                                                                                                |                                                                                                                    |             |
| No-load protection                                            |                                                            | continuous no-load stability                                                                                         |                                                                                                                    |             |
| Starting of capacitive loads                                  |                                                            | 7000 µF                                                                                                              | 3500 µF                                                                                                            | 7000 µF     |

## CP-E range

### Technical data

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

| Type                                                      |                                      | CP-E 24/0.75                                                   | CP-E 24/1.25           | CP-E 24/2.5 |
|-----------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------|-------------|
| General data                                              |                                      |                                                                |                        |             |
| Power loss                                                |                                      | typ. 4.45 W                                                    | typ. 5.5 W             | typ. 8.8 W  |
| Efficiency                                                |                                      | typ. 77 %                                                      | typ. 86 %              | typ. 89 %   |
| Duty cycle                                                |                                      | 100 %                                                          |                        |             |
| Dimensions                                                |                                      | see “Dimensional drawings”                                     |                        |             |
| Material of housing                                       |                                      | plastic                                                        |                        |             |
| 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    | 0.2-2.5 mm² (24-14 AWG)                                        |                        |             |
|                                                           | fine-strand without wire end ferrule |                                                                |                        |             |
|                                                           | rigid                                |                                                                |                        |             |
| Stripping length                                          |                                      | 6 mm (0.24 in)                                                 |                        |             |
| Tightening torque                                         | input / output                       | 0.6 Nm (5 lb.in)                                               |                        |             |
| Environmental data                                        |                                      |                                                                |                        |             |
| Ambient temperature range                                 | operation                            | -20...+70 °C                                                   | -40...+70 °C           |             |
|                                                           | rated load                           | -20...+60 °C                                                   | -40...+60 °C           |             |
|                                                           | storage                              | -20...+85 °C                                                   | -40...+85 °C           |             |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                    |                                      | 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 axes, 6 faces, 3 times for each face            |                        |             |
| Isolation data                                            |                                      |                                                                |                        |             |
| Rated insulation voltage U <sub>i</sub>                   | input circuit / output circuit       | 3 kV AC                                                        |                        |             |
|                                                           | input / PE                           | 1.5 kV AC                                                      |                        |             |
|                                                           | output / PE                          | 0.5 kV AC; 0.71 kV DC                                          |                        |             |
| Pollution degree                                          |                                      | 2                                                              |                        |             |
| Overvoltage category                                      |                                      | II                                                             |                        |             |
| Standards / Directives                                    |                                      |                                                                |                        |             |
| Standards                                                 |                                      | IEC/EN 60950-1                                                 |                        |             |
| Low Voltage Directive                                     |                                      | 2014/35/EU                                                     |                        |             |
| EMC Directive                                             |                                      | 2014/30/EU                                                     |                        |             |
| RoHS Directive                                            |                                      | 2011/65/EU                                                     |                        |             |
| Protective low voltage                                    |                                      | SELV (IEC/EN 60950-1)                                          |                        |             |
| Electromagnetic compatibility                             |                                      |                                                                |                        |             |
| Interference immunity to                                  |                                      | IEC/EN 61000-6-2                                               |                        |             |
| electrostatic discharge                                   | IEC/EN 61000-4-2                     | level 4 (air discharge 15 kV / contact discharge 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 / 2.5 kHz)                                       | level 4 (4 kV / 5 kHz) |             |
| surge                                                     | IEC/EN 61000-4-5                     | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                       |                        |             |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6                     | level 3 (10 V)                                                 |                        |             |
| power frequency magnetic fields                           | IEC/EN 61000-4-8                     | level 4 (30 A/m)                                               |                        |             |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11                    | dip: >95 % 10 ms / >30 % 500 ms, interruptions: >95 % 5000 ms  |                        |             |
| Interference emission                                     |                                      | IEC/EN 61000-6-3                                               |                        |             |
| high-frequency radiated                                   |                                      | class B                                                        |                        |             |
| high-frequency conducted                                  |                                      | class B                                                        |                        |             |
| limits for harmonic current emissions                     | IEC/EN 61000-3-2                     | class D                                                        | class A                |             |

## CP-E range

### Technical data

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

| Type                                                    |                                                         | CP-E 24/5.0                                                                                         | CP-E 24/10.0                                                                 | CP-E 24/20.0                                    |
|---------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------|
| Input circuit                                           |                                                         | L, N                                                                                                |                                                                              |                                                 |
| Rated input voltage U <sub>in</sub>                     |                                                         | 115 / 230 V AC auto select                                                                          |                                                                              | 115-230 V AC                                    |
| Input voltage range                                     |                                                         | 90-132 V AC,<br>180-264 V AC /<br>210-375 V DC                                                      | 90-132 V AC,<br>180-264 V AC /<br>210-375 V DC                               | 90-264 V AC,<br>120-375 V DC                    |
| Frequency range AC                                      |                                                         | 47-63 Hz                                                                                            |                                                                              |                                                 |
| Typical input current                                   | at 115 V AC                                             | 2.2 A                                                                                               | 4.0 A                                                                        | 4.9 A                                           |
|                                                         | at 230 V AC                                             | 0.83 A                                                                                              | 1.55 A                                                                       | 2.5 A                                           |
| Typical power consumption                               |                                                         | 140 W                                                                                               | 270 W                                                                        | 539 W                                           |
| Inrush current                                          | at 115 V AC                                             | 24 A (max. 5 ms)                                                                                    | 30 A (max. 5 ms)                                                             | 25 A (max. 5 ms)                                |
|                                                         | at 230 V AC                                             | 48 A (max. 5 ms)                                                                                    | 60 A (max. 5 ms)                                                             | 50 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                                     |                                                         | 3.15 A slow-acting /<br>250 V AC                                                                    | 6.3 A slow-acting / 250<br>V AC                                              | 10 A slow-acting /<br>250 V AC                  |
| Power factor correction (PFC)                           |                                                         | yes, passive, 0.7                                                                                   | yes, passive, 0.75                                                           | yes, active<br>115 V AC: 0.99<br>230 V AC: 0.97 |
| Indication of operational states                        |                                                         |                                                                                                     |                                                                              |                                                 |
| Output voltage                                          | green LED                                               | OUTPUT OK: <input type="checkbox"/> : output voltage OK                                             |                                                                              |                                                 |
|                                                         | red LED                                                 | OUTPUT LOW: <input type="checkbox"/> : output voltage too low                                       |                                                                              |                                                 |
| Output circuit                                          |                                                         | L+, L+, L-, L-                                                                                      |                                                                              |                                                 |
| Rated output voltage                                    |                                                         | 24 V DC                                                                                             |                                                                              |                                                 |
| Tolerance of the output voltage                         |                                                         | 0...+1 %                                                                                            |                                                                              |                                                 |
| Adjustment range of the output voltage                  |                                                         | 22.5-28.5 V DC                                                                                      |                                                                              |                                                 |
| Rated output power                                      |                                                         | 120 W                                                                                               | 240 W                                                                        | 480 W                                           |
| Rated output current I <sub>r</sub>                     | T <sub>a</sub> ≤ 60 °C                                  | 5 A                                                                                                 | 10 A                                                                         | -                                               |
|                                                         | T <sub>a</sub> ≤ 55 °C                                  | -                                                                                                   | -                                                                            | 20 A                                            |
| Derating of the output current                          | 60 °C < T <sub>a</sub> ≤ 70 °C                          | 2.5 %/°C                                                                                            |                                                                              | -                                               |
|                                                         | 55 °C < T <sub>a</sub> ≤ 70 °C                          | -                                                                                                   | -                                                                            | 2.5 %/°C                                        |
| Signalling contact for output voltage OK                |                                                         | 13-14 solid-state (max. 60 V DC, 0.3 A)                                                             |                                                                              |                                                 |
| Minimum fuse rating to achieve short-circuit protection |                                                         | 13-14 ≥ 60 V DC, ≤ 0.3 A fast-acting                                                                |                                                                              |                                                 |
| Maximum deviation with                                  | load change statical                                    | ±1 % (single mode), ±5 % (parallel mode)                                                            |                                                                              |                                                 |
|                                                         | change of output voltage within the input voltage range | ±0.5 %                                                                                              |                                                                              |                                                 |
| Recovery time T <sub>R</sub>                            |                                                         | < 2 ms                                                                                              |                                                                              |                                                 |
| Starting time after applying the supply voltage         | at I <sub>r</sub>                                       | max. 1 s                                                                                            | 2.5 s<br>(at -40 °C / 90 V AC<br>starting time >2.5 s has<br>to be expected) | max. 1 s                                        |
|                                                         | with 3500 µF                                            | max. 1.5 s                                                                                          | -                                                                            | -                                               |
|                                                         | with 7000 µF                                            | -                                                                                                   | 2.5 s                                                                        | max. 1.5 s                                      |
| Rise time                                               | at rated load                                           | max. 150 ms                                                                                         |                                                                              |                                                 |
|                                                         | with 3500 µF                                            | max. 500 ms                                                                                         | -                                                                            | -                                               |
|                                                         | with 7000 µF                                            | -                                                                                                   | max. 500 ms                                                                  |                                                 |
| Fall time                                               |                                                         | max. 150 ms                                                                                         |                                                                              |                                                 |
| Residual ripple and switching peaks                     |                                                         | BW = 20 MHz                                                                                         | 50 mV                                                                        | 100 mV                                          |
| Parallel connection                                     |                                                         | configurable, to increase power, up to 3 devices, min. 0.1 I <sub>r</sub> - max. 0.9 I <sub>r</sub> |                                                                              |                                                 |
| Series connection                                       |                                                         | yes, to increase voltage, max. 2 devices                                                            |                                                                              |                                                 |
| Resistance to reverse feed                              |                                                         | max. 35 V DC                                                                                        |                                                                              |                                                 |

## CP-E range

### Technical data

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

| Type                                                          | CP-E 24/5.0                                                    |                                        | CP-E 24/10.0          | CP-E 24/20.0 |
|---------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------|-----------------------|--------------|
| Output circuit - No-load, overload and short-circuit behavior |                                                                |                                        |                       |              |
| Characteristic curve of output                                | U/I characteristic curve                                       |                                        |                       |              |
| Short-circuit protection                                      | continuous short-circuit proof                                 |                                        |                       |              |
| Short-circuit behavior                                        | continuation with output power limiting                        |                                        |                       |              |
| Overload protection                                           | output power limiting                                          |                                        |                       |              |
| No-load protection                                            | continuous no-load stability                                   |                                        |                       |              |
| Starting of capacitive loads                                  | 3500 µF                                                        |                                        | 7000 µF               |              |
| General data                                                  |                                                                |                                        |                       |              |
| Power loss                                                    | typ. 20 W                                                      |                                        | typ. 35 W             | typ. 63 W    |
| Efficiency                                                    | typ. 86 %                                                      |                                        | typ. 89 %             | typ. 89 %    |
| Duty cycle                                                    | 100 %                                                          |                                        |                       |              |
| Dimensions                                                    | see “Dimensional drawings”                                     |                                        |                       |              |
| 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) |              |
|                                                               | 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                                                 | 1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in) |                       |              |
| Environmental data                                            |                                                                |                                        |                       |              |
| Ambient temperature range                                     | operation                                                      | -35...+70 °C                           | -40...+70 °C          |              |
|                                                               | rated load                                                     | -35...+60 °C                           | -40...+60 °C          | -40...+55 °C |
|                                                               | storage                                                        | -40...+85 °C                           | -40...+85 °C          |              |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                        | 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 axes, 6 faces, 3 times for each face            |                                        |                       |              |
| Isolation data                                                |                                                                |                                        |                       |              |
| Rated insulation voltage U <sub>i</sub>                       | input circuit / output circuit                                 |                                        | 3 kV AC               |              |
|                                                               | input / PE                                                     |                                        | 1.5 kV AC             |              |
|                                                               | output / PE                                                    |                                        | 0.5 kV AC; 0.71 kV DC |              |
|                                                               | signalling contact / PE                                        |                                        | 0.5 kV DC             |              |
| Pollution degree                                              | 2                                                              |                                        |                       |              |
| Overvoltage category                                          | II                                                             |                                        |                       |              |
| Standards / Directives                                        |                                                                |                                        |                       |              |
| Standards                                                     | IEC/EN 60950-1                                                 |                                        |                       |              |
| Low Voltage Directive                                         | 2014/35/EU                                                     |                                        |                       |              |
| EMC Directive                                                 | 2014/30/EU                                                     |                                        |                       |              |
| RoHS Directive                                                | 2011/65/EU                                                     |                                        |                       |              |
| Protective low voltage                                        | SELV (IEC/EN 60950-1)                                          |                                        |                       |              |



## CP-E range

### Technical data

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

| Type                                                      |                   | CP-E 24/5.0                                                     | CP-E 24/10.0             | CP-E 24/20.0 |
|-----------------------------------------------------------|-------------------|-----------------------------------------------------------------|--------------------------|--------------|
| Electromagnetic compatibility                             |                   |                                                                 |                          |              |
| Interference immunity to                                  |                   | IEC/EN 61000-6-2                                                |                          |              |
| electrostatic discharge                                   | IEC/EN 61000-4-2  | level 4 (air discharge 15 kV / contact discharge 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 / 5 kHz)                                          | level 4 (4 kV / 2.5 kHz) |              |
| surge                                                     | IEC/EN 61000-4-5  | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                        |                          |              |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6  | level 3 (10 V)                                                  |                          |              |
| power frequency magnetic fields                           | IEC/EN 61000-4-8  | level 4 (30 A/m)                                                |                          |              |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11 | dip: >95 % 10 ms / >30 % 500 ms<br>interruptions: >95 % 5000 ms |                          |              |
| Interference emission                                     |                   | IEC/EN 61000-6-3                                                |                          |              |
| high-frequency radiated                                   |                   | class B                                                         |                          |              |
| high-frequency conducted                                  |                   | class B                                                         |                          |              |
| limits for harmonic current emissions                     |                   | class D                                                         |                          |              |

## CP-E range

### Technical data

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

| Type                                            | CP-E 48/0.62                                            | CP-E 48/1.25                                                                                                       | CP-E 48/5.0                              | CP-E 48/10.0                                                                                                               |
|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Input circuit</b>                            |                                                         |                                                                                                                    |                                          |                                                                                                                            |
| <b>L, N</b>                                     |                                                         |                                                                                                                    |                                          |                                                                                                                            |
| Rated input voltage $U_{in}$                    | 100-240 V AC                                            |                                                                                                                    | 115 / 230 V AC auto select               | 115-230 V AC                                                                                                               |
| Input voltage range                             | 85-264 V AC / 90-375 V DC                               |                                                                                                                    | 90-132 V AC, 180-264 V AC / 210-375 V DC | 90-264 V AC, 120-375 V DC                                                                                                  |
| Frequency range AC                              | 47-63 Hz                                                |                                                                                                                    |                                          |                                                                                                                            |
| Typical input current                           | at 115 V AC                                             | 560 mA                                                                                                             | 1060 mA                                  | 4.0 A                                                                                                                      |
|                                                 | at 230 V AC                                             | 330 mA                                                                                                             | 590 mA                                   | 4.9 A                                                                                                                      |
| Typical power consumption                       |                                                         | 35.7 W                                                                                                             | 69.0 W                                   | 267 W                                                                                                                      |
| Inrush current                                  | at 115 V AC                                             | 20 A                                                                                                               | 30 A                                     | 30 A (max. 5 ms)                                                                                                           |
|                                                 | at 230 V AC                                             | 40 A                                                                                                               | 60 A                                     | 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. 20 ms                                                                                                         | min. 25 ms                               | min. 25 ms                                                                                                                 |
|                                                 | at 230 V AC                                             | min. 30 ms                                                                                                         |                                          |                                                                                                                            |
| Internal input fuse                             |                                                         | 2 A slow-acting / 250 V AC                                                                                         | 6.3 A slow-acting / 250 V AC             | 10 A slow-acting / 250 V AC                                                                                                |
| Power factor correction (PFC)                   |                                                         | no                                                                                                                 | yes, passive, 0.7                        | yes, active<br>115 V AC: 0.99<br>230 V AC: 0.97                                                                            |
| <b>Indication of operational states</b>         |                                                         |                                                                                                                    |                                          |                                                                                                                            |
| Output voltage                                  | green LED                                               | OUTPUT OK:  : output voltage OK |                                          |                                                                                                                            |
|                                                 | red LED                                                 | -                                                                                                                  | -                                        | OUTPUT LOW:  : output voltage too low |
| <b>Output circuit</b>                           |                                                         |                                                                                                                    |                                          |                                                                                                                            |
| <b>L+, L+, L-, L-</b>                           |                                                         |                                                                                                                    |                                          |                                                                                                                            |
| Rated output voltage                            | 48 V DC                                                 |                                                                                                                    |                                          |                                                                                                                            |
| Tolerance of the output voltage                 | 0...+1 %                                                |                                                                                                                    |                                          |                                                                                                                            |
| Adjustment range of the output voltage          | 48-55 V DC                                              |                                                                                                                    | 47-56 V DC                               |                                                                                                                            |
| Rated output power                              |                                                         | 30 W                                                                                                               | 60 W                                     | 240 W                                                                                                                      |
| Rated output current $I_r$                      | $T_a \leq 60\text{ °C}$                                 | 0.625 A                                                                                                            | 1.25 A                                   | 5 A                                                                                                                        |
|                                                 | $T_a \leq 55\text{ °C}$                                 | -                                                                                                                  | -                                        | 10 A                                                                                                                       |
| Derating of the output current                  | $60\text{ °C} < T_a \leq 70\text{ °C}$                  | 2.5 %/°C                                                                                                           |                                          | -                                                                                                                          |
|                                                 | $55\text{ °C} < T_a \leq 70\text{ °C}$                  | -                                                                                                                  | -                                        | 2.5 %/°C                                                                                                                   |
| Signalling output for output voltage OK         | DC OK                                                   | -                                                                                                                  | -                                        | -                                                                                                                          |
| Maximum deviation with                          | load change statical                                    | $\pm 0.5\%$                                                                                                        |                                          | $\pm 1\%$ (single mode)<br>$\pm 5\%$ (parallel mode)                                                                       |
|                                                 | change of output voltage within the input voltage range | $\pm 0.5\%$                                                                                                        |                                          | $\pm 0.5\%$                                                                                                                |
| Recovery time $T_R$                             |                                                         | < 2 ms                                                                                                             |                                          |                                                                                                                            |
| Starting time after applying the supply voltage | at $I_r$                                                | max. 1 s                                                                                                           |                                          |                                                                                                                            |
|                                                 | with 3500 $\mu\text{F}$                                 | max. 2 s                                                                                                           | -                                        | -                                                                                                                          |
|                                                 | with 7000 $\mu\text{F}$                                 | -                                                                                                                  | max. 1.5 s                               | max. 1.5 s                                                                                                                 |
| Rise time                                       | at rated load                                           | max. 150 ms                                                                                                        |                                          |                                                                                                                            |
|                                                 | with 3500 $\mu\text{F}$                                 | max. 500 ms                                                                                                        | -                                        | -                                                                                                                          |
|                                                 | with 7000 $\mu\text{F}$                                 | -                                                                                                                  | max. 500 ms                              | max. 500 ms                                                                                                                |
| Fall time                                       |                                                         | max. 150 ms                                                                                                        |                                          |                                                                                                                            |
| Residual ripple and switching peaks             | BW = 20 MHz                                             | 50 mV                                                                                                              |                                          | 100 mV                                                                                                                     |
| Parallel connection                             |                                                         | yes, to enable redundancy                                                                                          |                                          | configurable, to increase power, up to 3 devices, min. 0.1 $I_r$ - max. 0.9 $I_r$                                          |
| Series connection                               |                                                         | yes, to increase voltage                                                                                           |                                          | yes, to increase voltage, max. 2 devices                                                                                   |
| Resistance to reverse feed                      |                                                         | 1 s - max. 63 V DC                                                                                                 |                                          |                                                                                                                            |

## CP-E range

### Technical data

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

| Type                                                          | CP-E 48/0.62                                                   |                                   | CP-E 48/1.25 | CP-E 48/5.0                            | CP-E 48/10.0 |
|---------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------|--------------|----------------------------------------|--------------|
| Output circuit - No-load, overload and short-circuit behavior |                                                                |                                   |              |                                        |              |
| Characteristic curve of output                                | U/I characteristic curve                                       |                                   |              |                                        |              |
| Short-circuit protection                                      | continuous short-circuit proof                                 |                                   |              |                                        |              |
| Short-circuit behavior                                        | continuation with output power limiting                        |                                   |              |                                        |              |
| Overload protection                                           | output power limiting                                          |                                   |              |                                        |              |
| No-load protection                                            | continuous no-load stability                                   |                                   |              |                                        |              |
| Starting of capacitive loads                                  | 3500 μF                                                        | 7000 μF                           | unlimited    | 7000 μF                                |              |
| General data                                                  |                                                                |                                   |              |                                        |              |
| Power loss                                                    | typ. 4.9 W                                                     | typ. 7.8 W                        | typ. 32 W    | typ. 60 W                              |              |
| Efficiency                                                    | typ. 86 %                                                      | typ. 89 %                         | typ. 90 %    |                                        |              |
| Duty cycle                                                    | 100 %                                                          |                                   |              |                                        |              |
| Dimensions                                                    | see “Dimensional drawings”                                     |                                   |              |                                        |              |
| Material of housing                                           | plastic                                                        |                                   |              | 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                                            | IP/20 / IP20                      |              |                                        |              |
| Protection class                                              | I                                                              |                                   |              |                                        |              |
| Electrical connection - input circuit / output circuit        |                                                                |                                   |              |                                        |              |
| Connecting capacity                                           | fine-strand with wire end ferrule                              | 0.2-2.5 mm² (24-14 AWG)           |              | 0.2-4 mm² (24-11 AWG)                  |              |
|                                                               | fine-strand without wire end ferrule                           |                                   |              | 0.2-6 mm² (24-10 AWG)                  |              |
|                                                               | rigid                                                          |                                   |              |                                        |              |
| Stripping length                                              |                                                                | 6 mm (0.24 in)                    |              | 8 mm (0.31 in)                         |              |
| Tightening torque                                             | input / output                                                 | 0.6 Nm (5 lb.in)                  |              | 1.0 Nm (9 lb.in) / 0.62 Nm (5.5 lb.in) |              |
| Environmental data                                            |                                                                |                                   |              |                                        |              |
| Ambient temperature range                                     | operation                                                      | -40...+70 °C                      |              |                                        |              |
|                                                               | rated load                                                     | -40...+60 °C                      |              |                                        | -40...+55 °C |
|                                                               | storage                                                        | -40...+85 °C                      |              |                                        |              |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                        | 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 axes, 6 faces, 3 times for each face            |                                   |              |                                        |              |
| Isolation data                                                |                                                                |                                   |              |                                        |              |
| Rated insulation voltage U <sub>i</sub>                       | input circuit / output circuit                                 | 3 kV AC                           |              |                                        |              |
|                                                               | input / PE                                                     | 1.5 kV AC                         |              |                                        |              |
|                                                               | output / PE                                                    | 0.5 kV AC; 0.71 kV DC             |              |                                        |              |
| Pollution degree                                              | 2                                                              |                                   |              |                                        |              |
| Overvoltage category                                          | II                                                             |                                   |              |                                        |              |
| Standards / Directives                                        |                                                                |                                   |              |                                        |              |
| Standards                                                     | EN 61204-3                                                     |                                   |              |                                        |              |
| Low Voltage Directive                                         | 2014/35/EU                                                     |                                   |              |                                        |              |
| EMC Directive                                                 | 2014/30/EU                                                     |                                   |              |                                        |              |
| RoHS Directive                                                | 2011/65/EU                                                     |                                   |              |                                        |              |
| Protective low voltage                                        | SELV (IEC/EN 60950-1)                                          |                                   |              |                                        |              |

## CP-E range

### Technical data

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

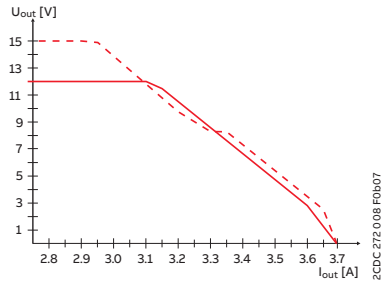
| Type                                                      |                   | CP-E 48/0.62                                                  | CP-E 48/1.25 | CP-E 48/5.0              | CP-E 48/10.0 |
|-----------------------------------------------------------|-------------------|---------------------------------------------------------------|--------------|--------------------------|--------------|
| Electromagnetic compatibility                             |                   |                                                               |              |                          |              |
| Interference immunity to                                  |                   | IEC/EN 61000-6-2                                              |              |                          |              |
| electrostatic discharge                                   | IEC/EN 61000-4-2  | level 4 (air discharge 15 kV / contact discharge 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 / 5 kHz)                                        |              | level 4 (4 kV / 2.5 kHz) |              |
| surge                                                     | IEC/EN 61000-4-5  | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                      |              |                          |              |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6  | level 3 (10 V/m)                                              |              |                          |              |
| power frequency magnetic fields                           | IEC/EN 61000-4-8  | level 4 (30 A/m)                                              |              |                          |              |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11 | dip: >95 % 10 ms / >30 % 500 ms, interruptions: >95 % 5000 ms |              |                          |              |
| Interference emission                                     |                   | IEC/EN 61000-6-3                                              |              |                          |              |
| high-frequency radiated                                   |                   | class B                                                       |              |                          |              |
| high-frequency conducted                                  |                   | class B                                                       |              |                          |              |
| limits for harmonic current emissions                     |                   | class A                                                       |              | class D                  |              |



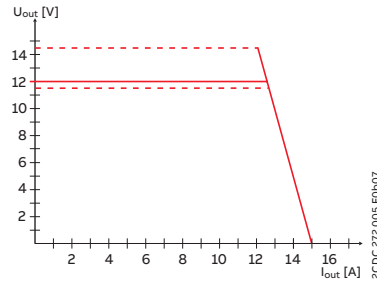
## CP-E range

### Technical diagrams

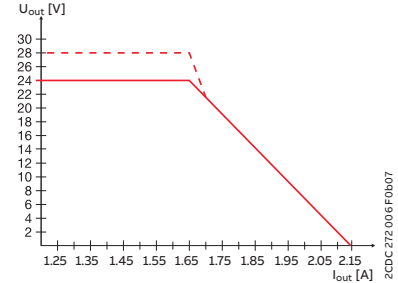
#### Output curve at $T_a = 25^\circ\text{C}$



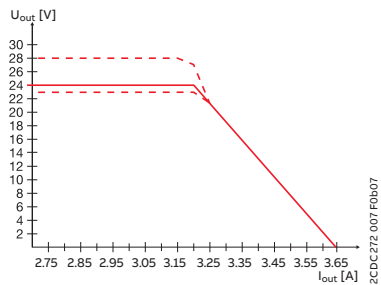
CP-E 12/2.5



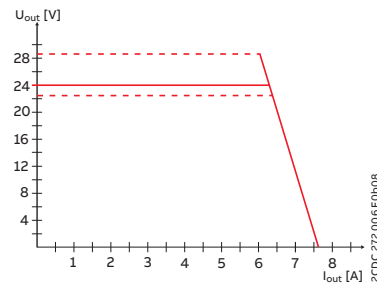
CP-E 12/10.0



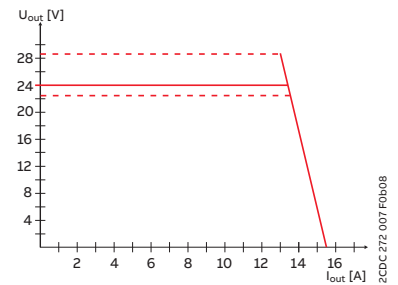
CP-E 24/1.25



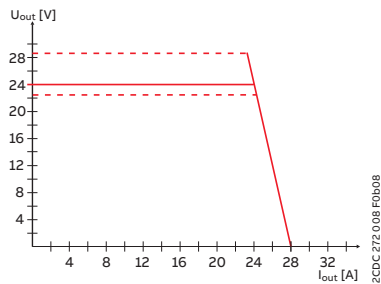
CP-E 24/2.5



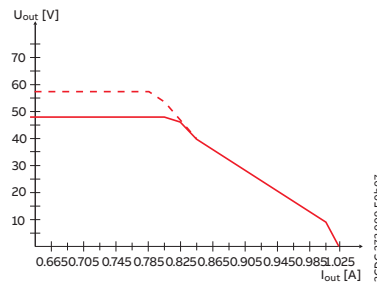
CP-E 24/5.0



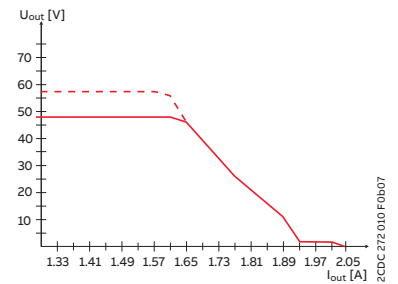
CP-E 24/10.0



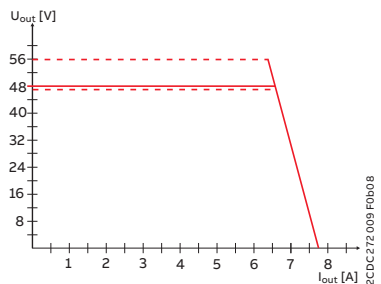
CP-E 24/20.0



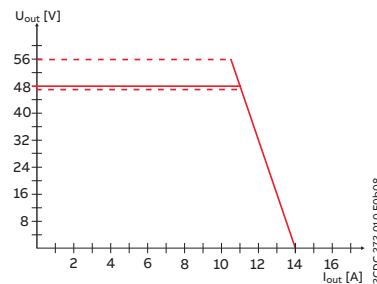
CP-E 48/0.62



CP-E 48/1.25



CP-E 48/5.0

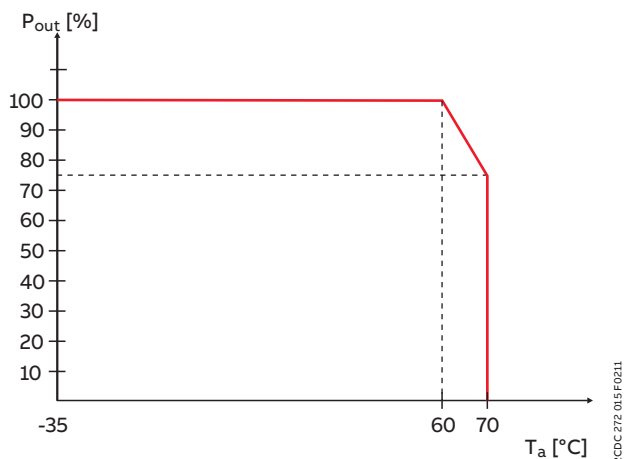


CP-E 48/10.0

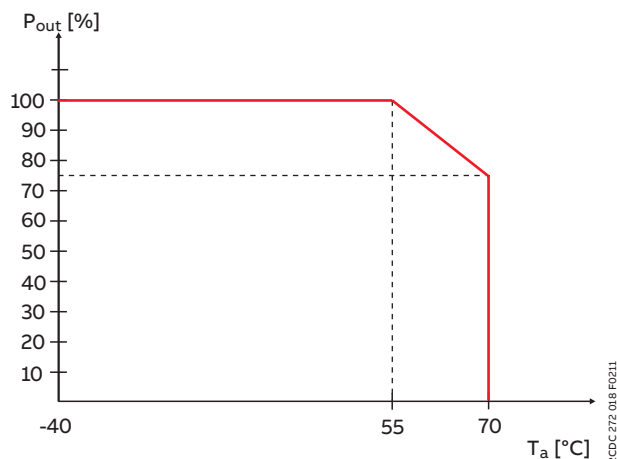
## CP-E range

### Technical diagrams

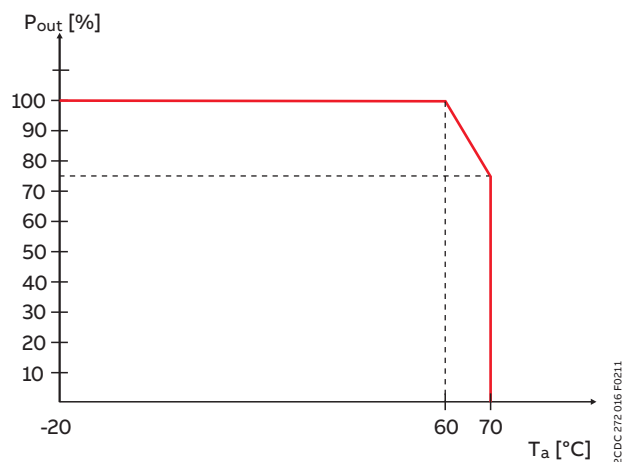
#### Temperature behavior at $T_a = 25\text{ °C}$



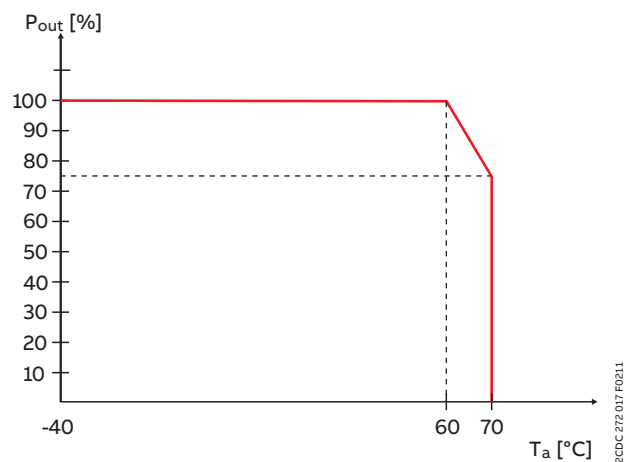
CP-E 12/10.0, CP-E 24/5.0



CP-E 24/20.0, CP-E 48/10.0



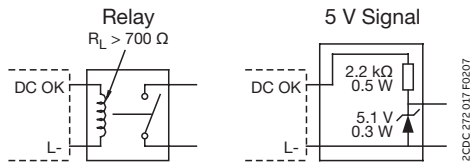
CP-E 5/3.0, CP-E 24/0.75

CP-E 12/2.5, CP-E 24/1.25, CP-E 48/0.62,  
CP-E 24/2.5, CP-E 48/1.25, CP-E 24/10.0, CP-E 48/5.0

## CP-E range

### Technical diagrams

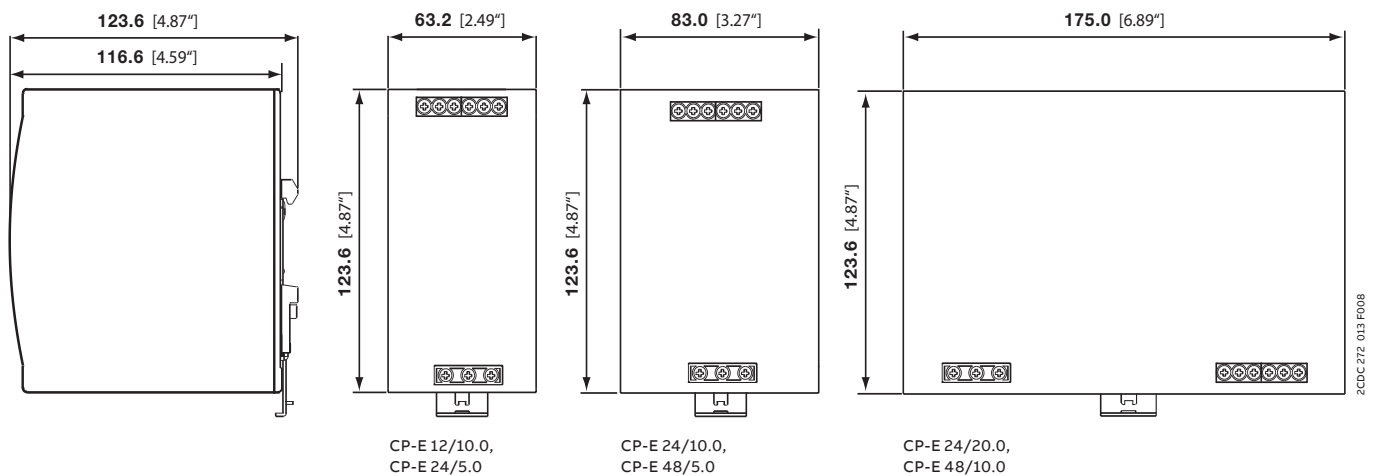
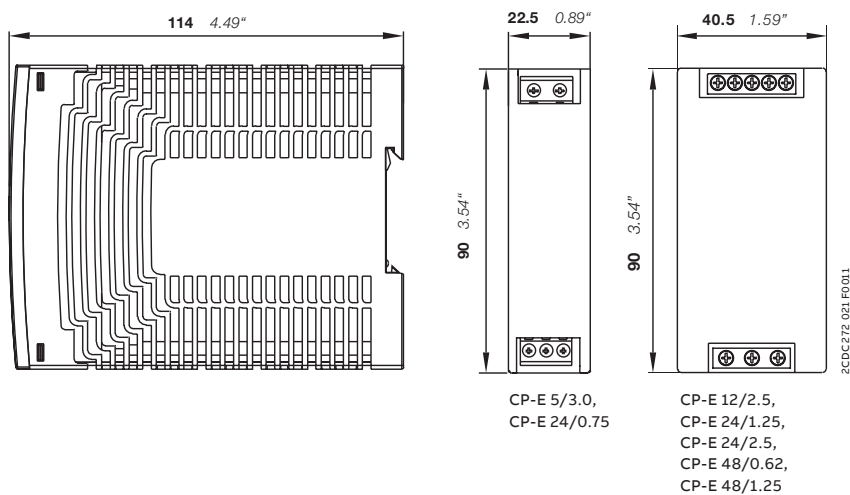
#### Wiring instructions



CP-E 24/1.25, CP-E 24/2.5

#### Dimensional drawings

Dimensions in **mm**, inches





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## **CP-T range**

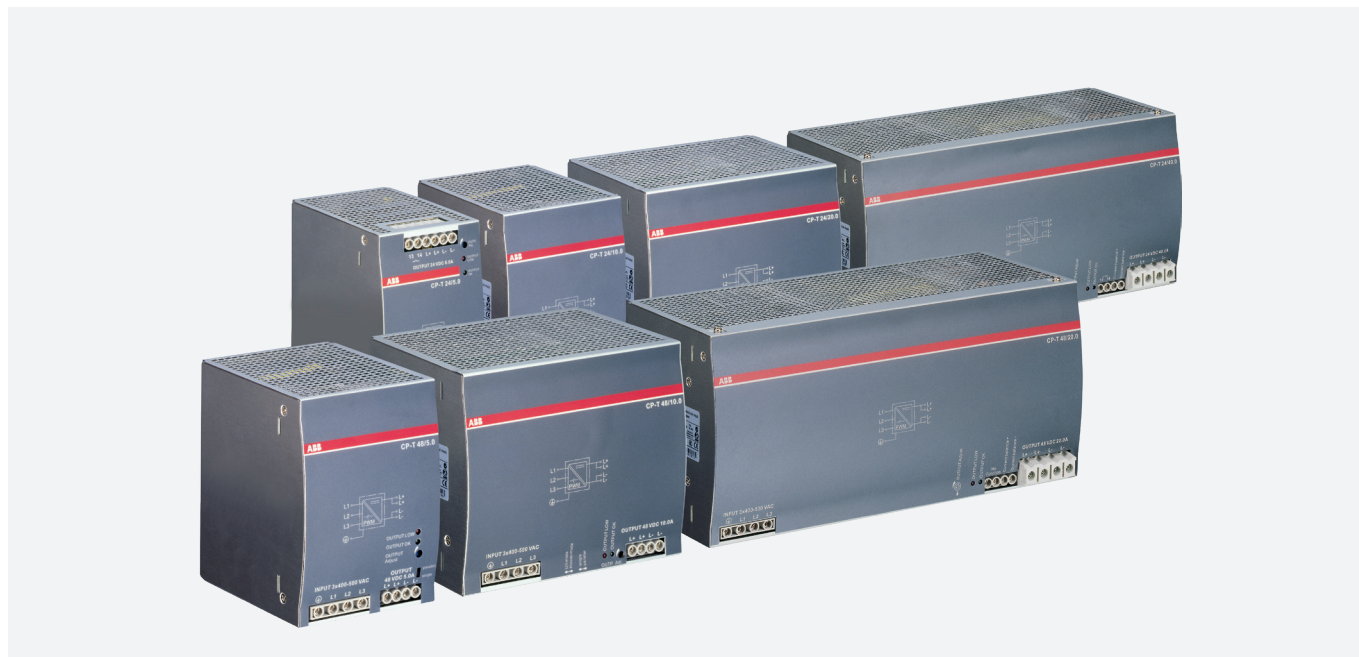
### Table of contents

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## CP-T range

### Benefits and advantages



ABB's CP-T range of three-phase power supply units perfectly complements our existing power supply offering in terms of design and functionality, giving you more advanced options for your three-phase applications.



**Affordable range**

Products with exactly the functions you require. Designed for best price-performance ratio.



**Global availability**

The product can be used in any installation in the world. Giving you the confidence of world-wide sourcing – no matter where you build, install or operate your equipment.



**Speed up your projects**

Data available for common planning software: Less engineering time required

# CP-T range

## Benefits and advantages



### Characteristics

- Rated output voltages 24 V, 48 V DC
- Output voltage adjustable via front-facing rotary potentiometer "OUTPUT Adjust"
- Rated output currents 5 A, 10 A, 20 A, 40 A
- Rated output powers 120 W, 240 W, 480 W, 960 W
- Three-phase operation (see derating note)
- Two-phase operation (25 % derating possible, see derating note)
- Supply range 3 x 400–500 V AC (3 x 340–575 V AC, 480–820 V DC)
- Typical efficiency of 93 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling with ventilators)
- Ambient temperature range during operation -40...+70 °C <sup>1)</sup>
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- Redundancy unit CP-C.1-A-RU (-C) offering true redundancy, available as accessory
- LEDs for status indication
- Signalling contact "13-14" (solid-state) for output voltage OK on 24 V devices
- Various approvals and marks

<sup>1)</sup> 480 W variants: -30...+70°C



### Main benefits

#### Signalling output

Some devices of the CP-T series offer a solid-state output for function monitoring and remote diagnostics.

#### Wide input range

Optimized for worldwide applications: The CP-T power supplies can be used in 340 - 575 V AC or 480 - 820 V DC supply systems.

#### Adjustable output voltage

The CP-T range features a continuously adjustable output voltage. Thus, they can be optimally adapted to the applications, e.g. compensating the voltage drop caused by a long line length.



# CP-T range

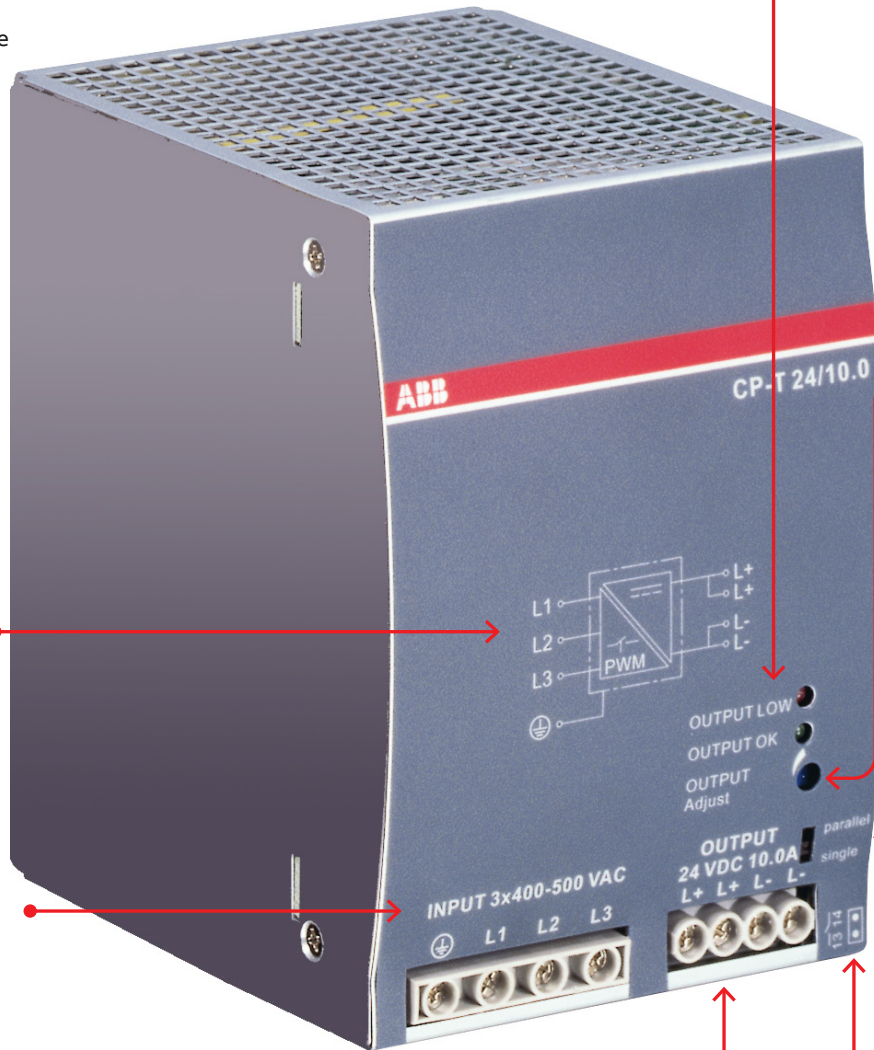
## Operating controls

### Indication of operational states

- OUTPUT OK: green LED - green LED - output voltage OK
- OUTPUT LOW: red LED - output voltage too low

### Circuit diagram

**INPUT L1, L2, L3, PE:**  
Terminals - input  
340-575 V AC /  
480-820 V DC



**OUTPUT Adjust:**  
Potentiometer -  
adjustment of  
output voltage  
22.5...28.5V DC

**Single/parallel:**  
Sliding switch -  
adjustment of  
single or parallel  
operation

**OUTPUT L+, L+, L-, L-:**  
Terminals - output  
24 V DC, 48 V DC

**13-14:**  
**Terminals - signalling contact**  
A solid-state output  
indicates the error-free  
operation of the  
output voltage



**Tunnel drilling  
machines**



**Quality power  
management systems**



**Floor  
conveyors**



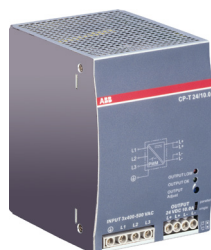
## CP-T range

### Ordering details



2CDC 271 043 50009

CP-T 24/5.0



2CDC 271 045 50009

CP-T 24/10.0, CP-T 48/5.0



2CDC 271 047 50009

CP-T 24/20.0, CP-T 48/10.0

### Description

In terms of design and functionality, the CP-T range perfectly supplements the existing products and extends the range appropriately. The devices can be supplied with a three-phase voltage as well as with two-phase mains. Here, ABB offers power supply units with 24 V DC and 48 V DC outputs with 5 A, 10 A, 20 A and 40 A and efficiency of up to 93 %.

As in the case of all products, they are designed for an ambient temperature of up to 70 °C. All products can be supplied within an AC supply voltage range between 340 to 575 V AC and a DC supply voltage range between 480 to 820 V DC.

### Ordering details

| Input voltage range         | Rated output voltage / current | Type         | Order code      | Weight (1 pc.) kg (lb) |
|-----------------------------|--------------------------------|--------------|-----------------|------------------------|
| 340-575 V AC / 480-820 V DC | 24 V DC / 5 A                  | CP-T 24/5.0  | 1SVR427054R0000 | 0.80 (1.77)            |
| 340-575 V AC / 480-820 V DC | 24 V DC / 10 A                 | CP-T 24/10.0 | 1SVR427055R0000 | 1.05 (2.31)            |
| 340-575 V AC / 480-820 V DC | 24 V DC / 20 A                 | CP-T 24/20.0 | 1SVR427056R0000 | 1.75 (3.86)            |
| 340-575 V AC / 480-820 V DC | 24 V DC / 40 A                 | CP-T 24/40.0 | 1SVR427057R0000 | 3.20 (7.05)            |
| 340-575 V AC / 480-820 V DC | 48 V DC / 5 A                  | CP-T 48/5.0  | 1SVR427054R2000 | 1.05 (2.31)            |
| 340-575 V AC / 480-820 V DC | 48 V DC / 10 A                 | CP-T 48/10.0 | 1SVR427055R2000 | 1.75 (3.86)            |
| 340-575 V AC / 480-820 V DC | 48 V DC / 20 A                 | CP-T 48/20.0 | 1SVR427056R2000 | 3.40 (7.50)            |



## CP-T range

### Technical data

Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 3 \times 400\text{ V AC}$  and rated values, unless otherwise indicated

| Type                                                          | CP-T 24/5.0                                             | CP-T 24/10.0                                                                                       | CP-T 24/20.0                   | CP-T 24/40.0                                                                                                       |
|---------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Input circuit                                                 | L1, L2, L3                                              |                                                                                                    |                                |                                                                                                                    |
| Rated input voltage U <sub>in</sub>                           | 3 x 400-500 V AC                                        |                                                                                                    |                                |                                                                                                                    |
| Input voltage range                                           | 340-575 V AC                                            |                                                                                                    |                                |                                                                                                                    |
|                                                               | 480-820 V DC                                            |                                                                                                    |                                |                                                                                                                    |
| Frequency range AC                                            | 47-63 Hz                                                |                                                                                                    |                                |                                                                                                                    |
| Typical input current                                         | 0.36 A                                                  | 0.65 A                                                                                             | 1.1 A                          | 1.72 A                                                                                                             |
| Typical power consumption                                     | 135 W                                                   | 270 W                                                                                              | 538 W                          | 1058 W                                                                                                             |
| Inrush current                                                | typ. 10 A                                               | 20 A                                                                                               |                                | 30 A                                                                                                               |
| Power failure buffering time                                  | min. 20 ms                                              |                                                                                                    |                                | min. 15 ms                                                                                                         |
| Internal input fuse                                           | per phase 2 A / 600 V AC                                | T 3.15 A / 500 V AC                                                                                |                                | T 5 A / 500 V AC                                                                                                   |
| Recommended backup fuse                                       | 3 pole miniature circuit breaker ABB Type S203          |                                                                                                    |                                |                                                                                                                    |
| Power factor correction (PFC)                                 | yes, passive                                            |                                                                                                    |                                |                                                                                                                    |
| Discharge current                                             | towards PE                                              | < 3.5 mA                                                                                           |                                |                                                                                                                    |
|                                                               | input / output                                          | < 0.25 mA                                                                                          |                                |                                                                                                                    |
| Indication of operational states                              |                                                         |                                                                                                    |                                |                                                                                                                    |
| Output voltage                                                | OUTPUT OK: green LED                                    | output voltage OK when the output voltage > 75 % of the rated output voltage                       |                                |                                                                                                                    |
|                                                               | OUTPUT LOW: red LED                                     | output voltage too low when the output voltage < 70 % of the rated output voltage                  |                                |                                                                                                                    |
| Output circuit                                                | L+, L+, L-, L-                                          |                                                                                                    |                                |                                                                                                                    |
| Rated output voltage                                          | 24 V DC                                                 |                                                                                                    |                                |                                                                                                                    |
| Tolerance of the output voltage                               | 0...+1 %                                                |                                                                                                    |                                |                                                                                                                    |
| Adjustment range of the output voltage                        | 22.5-28.5 V DC                                          |                                                                                                    |                                |                                                                                                                    |
| Rated output power                                            | 120 W                                                   | 240 W                                                                                              | 480 W                          | 960 W                                                                                                              |
| Rated output current I <sub>r</sub>                           | T <sub>a</sub> ≤ 60 °C 5 A                              | 10 A                                                                                               | 20 A                           | 40 A                                                                                                               |
| Derating of the output current                                | 60 °C < T <sub>a</sub> ≤ 70 °C                          | 2.5 %/°C                                                                                           |                                | 3.5 %/°C                                                                                                           |
| Signalling contact for output voltage OK                      | 13-14                                                   | solid-state (max. 60 V DC, 0.3 A)                                                                  |                                |                                                                                                                    |
|                                                               | Threshold                                               | 17.6-19.4 V                                                                                        |                                |                                                                                                                    |
|                                                               | Insulation voltage                                      | 500 V DC                                                                                           |                                |                                                                                                                    |
| Minimum fuse rating to achieve short-circuit protection       | 13-14                                                   | ≥ 60 V DC, ≤ 0.3 A fast-acting                                                                     |                                |                                                                                                                    |
| Maximum deviation with                                        | load change statical                                    | ±1 %                                                                                               | ±1 % (single mode)             |                                                                                                                    |
|                                                               |                                                         | -                                                                                                  | ±5 % (parallel mode)           |                                                                                                                    |
|                                                               | change of output voltage within the input voltage range | ± 0.5 %                                                                                            |                                |                                                                                                                    |
| Recovery time T <sub>A</sub>                                  | at nominal load                                         | < 2 ms                                                                                             |                                |                                                                                                                    |
| Starting time after applying the supply voltage               | at I <sub>r</sub>                                       | max. 1 s                                                                                           |                                |                                                                                                                    |
|                                                               | with 3500 µF                                            | max. 1.5 s                                                                                         |                                |                                                                                                                    |
| Rise time                                                     | at nominal load                                         | max. 150 ms                                                                                        |                                |                                                                                                                    |
|                                                               | with 3500 µF                                            | max. 500 ms                                                                                        |                                |                                                                                                                    |
| Fall time                                                     |                                                         | max. 150 ms                                                                                        |                                |                                                                                                                    |
| Residual ripple and switching peaks                           | BW = 20 MHz                                             | 100 mV                                                                                             |                                | 80 mV                                                                                                              |
| Parallel connection                                           | not supported                                           | configurable, to increase power, up to 2 devices, min. 0.1 I <sub>r</sub> - max 0.9 I <sub>r</sub> |                                | to increase power, up to 2 devices, min. 0.1 I <sub>r</sub> - max. 0.9 I <sub>r,use</sub> active current balancing |
| Series connection                                             | not supported                                           | yes, to increase voltage, max. 2 devices                                                           |                                |                                                                                                                    |
| Resistance to reverse feed                                    |                                                         | approx. 35 V                                                                                       |                                |                                                                                                                    |
| Output circuit - No-load, overload and short-circuit behavior |                                                         |                                                                                                    |                                |                                                                                                                    |
| Characteristic curve of output                                | combined U/I characteristic curve and hiccup mode       |                                                                                                    | U/I- or hiccup-mode adjustable | hiccup / fold back behavior                                                                                        |
| Short-circuit protection                                      | continuous short-circuit proof                          |                                                                                                    |                                |                                                                                                                    |
| Short-circuit behavior                                        | current limiting                                        |                                                                                                    |                                |                                                                                                                    |
| Overload protection                                           | hiccup mode                                             |                                                                                                    |                                |                                                                                                                    |
| No-load protection                                            | continuous no-load stability                            |                                                                                                    |                                |                                                                                                                    |
| Overtemperature protection                                    | yes, automatic recovery after temperature went down     |                                                                                                    |                                |                                                                                                                    |
| Starting of capacitive loads                                  | 3500 µF                                                 | 7000 µF                                                                                            | 7000 µF                        | 7000 µF                                                                                                            |

## CP-T range

### Technical data

Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 3 \times 400\text{ V AC}$  and rated values, unless otherwise indicated

| Type                                                                        |                                      | CP-T 24/5.0                                                    | CP-T 24/10.0           | CP-T 24/20.0 | CP-T 24/40.0                         |
|-----------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|------------------------|--------------|--------------------------------------|
| General data                                                                |                                      |                                                                |                        |              |                                      |
| Efficiency                                                                  |                                      | typ. 89 %                                                      | typ. 90 %              |              | typ. 92 %                            |
| Duty cycle                                                                  |                                      | 100 %                                                          |                        |              |                                      |
| Dimensions                                                                  |                                      | see “Dimensional drawings”                                     |                        |              |                                      |
| 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 / signalling circuit |                                      |                                                                |                        |              |                                      |
| Connecting capacity                                                         | 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                                | 0.2-6 mm² (24-10 AWG)                                          |                        |              |                                      |
| Stripping length                                                            |                                      | 8 mm (0.31 in)                                                 |                        |              |                                      |
| Tightening torque                                                           | input / output                       | 1 Nm (9 lb.in) / 0.6 Nm (5.5 lb.in)                            |                        |              | 1 Nm (9 lb.in) / 1.8 Nm (15.6 lb.in) |
| Environmental data                                                          |                                      |                                                                |                        |              |                                      |
| Ambient temperature range                                                   | operation                            | -40...+70 °C                                                   |                        | -30...+70 °C | -40...+70 °C                         |
|                                                                             | rated load                           | -40...+60 °C                                                   |                        | -30...+60 °C | -40...+60 °C                         |
|                                                                             | storage                              | -40...+85 °C                                                   |                        |              |                                      |
| Altitude during operation                                                   | IEC/EN 60068-2-13                    | max. 5000 m                                                    |                        |              |                                      |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                                      |                                      | 95 % without condensation                                      |                        |              |                                      |
| Vibration (sinusoidal) (IEC/EN 60068-2-6)                                   |                                      | 10-500 Hz, 2G, each along X, Y, Z axes 60 min / cycle          |                        |              |                                      |
| Shock (half-sine) (IEC/EN 60068-2-27)                                       |                                      | 15 g, 11 ms, 3 axes, 6 faces, 3 times for each face            |                        |              |                                      |
| Isolation data                                                              |                                      |                                                                |                        |              |                                      |
| Rated insulation voltage U <sub>i</sub>                                     | input circuit / output circuit       | 3 kV AC                                                        |                        |              |                                      |
|                                                                             | input / PE                           | 1.5 kV AC                                                      |                        |              |                                      |
|                                                                             | output / PE                          | 0.5 kV AC; 0.71 kV DC                                          |                        |              |                                      |
|                                                                             | signalling output / PE               | 0.5 kV DC                                                      |                        |              |                                      |
| Pollution degree                                                            |                                      | 2                                                              |                        |              |                                      |
| Standards / Directives                                                      |                                      |                                                                |                        |              |                                      |
| Standards                                                                   |                                      | IEC/EN 60950-1                                                 |                        |              |                                      |
| Low Voltage Directive                                                       |                                      | 2014/35/EU                                                     |                        |              |                                      |
| EMC Directive                                                               |                                      | 2014/30/EU                                                     |                        |              |                                      |
| RoHS Directive                                                              |                                      | 2011/65/EU                                                     |                        |              |                                      |
| Protective low voltage                                                      |                                      | SELV (IEC/EN 60950-1)                                          |                        |              |                                      |
| Electromagnetic compatibility                                               |                                      |                                                                |                        |              |                                      |
| Interference immunity to                                                    |                                      | IEC/EN 61000-6-2                                               |                        |              |                                      |
| electrostatic discharge                                                     | IEC/EN 61000-4-2                     | level 4 (air discharge 15 kV / contact discharge 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 / 2.5 kHz)                                       | level 4 (4 kV / 5 kHz) |              |                                      |
| surge                                                                       | IEC/EN 61000-4-5                     | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                       |                        |              |                                      |
| conducted disturbances, induced by radio-frequency fields                   | IEC/EN 61000-4-6                     | level 3 (10 V)                                                 |                        |              |                                      |
| power frequency magnetic fields                                             | IEC/EN 61000-4-8                     | level 4 (30 A/m)                                               |                        |              |                                      |
| voltage dips, short interruptions and voltage variations                    | IEC/EN 61000-4-11                    | dips: >95 % 0.5 ms / >30 % 0.5 ms, interruptions: >95 % 250 ms |                        |              |                                      |
| Interference emission                                                       |                                      | IEC/EN 61000-6-3                                               |                        |              |                                      |
| high-frequency radiated                                                     |                                      | class B                                                        |                        |              |                                      |
| high-frequency conducted                                                    |                                      | class B                                                        |                        |              |                                      |
| limits for harmonic current emissions                                       | IEC/EN 61000-3-2                     | class A                                                        |                        |              |                                      |

## CP-T range

### Technical data

Data at  $T_a = 25\text{ }^{\circ}\text{C}$ ,  $U_{in} = 3 \times 400\text{ V AC}$  and rated values, unless otherwise indicated

| Type                                                          | CP-T 48/5.0                                                        |                                                                                   | CP-T 48/10.0                     | CP-T 48/20.0                                                                                       |
|---------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------------|
| Input circuit                                                 | L1, L2, L3                                                         |                                                                                   |                                  |                                                                                                    |
| Rated input voltage $U_{in}$                                  | 3 x 400-500 V AC                                                   |                                                                                   |                                  |                                                                                                    |
| Input voltage range                                           | 340-575 V AC<br>480-820 V DC                                       |                                                                                   |                                  |                                                                                                    |
| Frequency range AC                                            | 47-63 Hz                                                           |                                                                                   |                                  |                                                                                                    |
| Typical input current                                         | 0.65 A                                                             | 1.1 A                                                                             | 1.72 A                           |                                                                                                    |
| Typical power consumption                                     | 264 W                                                              | 535 W                                                                             | 1050 W                           |                                                                                                    |
| Inrush current                                                | typ.                                                               | 20 A                                                                              |                                  | 30 A                                                                                               |
| Power failure buffering time                                  |                                                                    | min. 20 ms                                                                        |                                  | min. 15 ms                                                                                         |
| Internal input fuse                                           | per phase                                                          | 2 A / 600 V AC                                                                    | T 3.15 A / 500 V AC              | T 5 A / 500 V AC                                                                                   |
| Power factor correction (PFC)                                 |                                                                    | yes, passive                                                                      |                                  |                                                                                                    |
| Discharge current                                             | towards PE                                                         | < 3.5 mA                                                                          |                                  |                                                                                                    |
|                                                               | input / output                                                     | < 0.25 mA                                                                         |                                  |                                                                                                    |
| Indication of operational states                              |                                                                    |                                                                                   |                                  |                                                                                                    |
| Output voltage                                                | OUTPUT OK: green LED                                               | output voltage OK when the output voltage > 75 % of the rated output voltage      |                                  |                                                                                                    |
|                                                               | OUTPUT LOW: red LED                                                | output voltage too low when the output voltage < 70 % of the rated output voltage |                                  |                                                                                                    |
| 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                                                              | 480 W                                                                             | 960 W                            |                                                                                                    |
| Rated output current $I_r$                                    | $T_a \leq 60\text{ }^{\circ}\text{C}$                              | 5 A                                                                               | 10 A                             | 20 A                                                                                               |
| Derating of the output current                                | $60\text{ }^{\circ}\text{C} < T_a \leq 70\text{ }^{\circ}\text{C}$ | 2.5 %/°C                                                                          |                                  | 3.5 %/°C                                                                                           |
| Maximum deviation with                                        | load change statical                                               | $\pm 1\text{ }\%$ (single mode)<br>$\pm 5\text{ }\%$ (parallel mode)              |                                  |                                                                                                    |
|                                                               | change of output voltage within the input voltage range            | $\pm 0.5\text{ }\%$                                                               |                                  |                                                                                                    |
| Recovery time $T_A$                                           | at rated load                                                      | < 2 ms                                                                            |                                  |                                                                                                    |
| Starting time after applying the supply voltage               | at $I_r$                                                           | max. 1 s                                                                          |                                  |                                                                                                    |
|                                                               | with 7000 $\mu\text{F}$                                            | max. 1.5 s                                                                        |                                  |                                                                                                    |
| Rise time                                                     | at rated load                                                      | max. 150 ms                                                                       |                                  |                                                                                                    |
|                                                               | with 7000 $\mu\text{F}$                                            | max. 500 ms                                                                       |                                  |                                                                                                    |
| Fall time                                                     |                                                                    | max. 150 ms                                                                       |                                  |                                                                                                    |
| Residual ripple and switching peaks                           | BW = 20 MHz                                                        | 100 mV                                                                            |                                  | 80 mV                                                                                              |
| Parallel connection                                           |                                                                    | configurable, to increase power, up to 2 devices, min. 0.1 $I_r$ - max 0.9 $I_r$  |                                  | to increase power, up to 2 devices, min. 0.1 $I_r$ - max. 0.9 $I_r$ , use active current balancing |
| Series connection                                             |                                                                    | yes, to increase voltage, max. 2 devices                                          |                                  |                                                                                                    |
| Resistance to reverse feed                                    |                                                                    | approx. 35 V                                                                      | approx. 63 V                     | approx. 63 V                                                                                       |
| Output circuit - No-load, overload and short-circuit behavior |                                                                    |                                                                                   |                                  |                                                                                                    |
| Characteristic curve of output                                |                                                                    | combined U/I and hiccup mode                                                      | U/I or hiccup mode, configurable | hiccup mode / fold back behavior                                                                   |
| Short-circuit protection                                      |                                                                    | continuous short-circuit proof                                                    |                                  |                                                                                                    |
| Short-circuit behavior                                        |                                                                    | current limiting                                                                  |                                  |                                                                                                    |
| Overload protection                                           |                                                                    | hiccup mode                                                                       |                                  |                                                                                                    |
| No-load protection                                            |                                                                    | continuous no-load stability                                                      |                                  |                                                                                                    |
| Over temperature protection                                   |                                                                    | yes, automatic recovery after temperature went down                               |                                  |                                                                                                    |
| Starting of capacitive loads                                  |                                                                    | 7000 $\mu\text{F}$                                                                |                                  |                                                                                                    |

## CP-T range

### Technical data

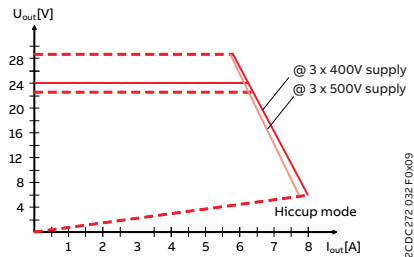
Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 3 \times 400\text{ V AC}$  and rated values, unless otherwise indicated

| Type                                                      |                                      | CP-T 48/5.0                                                      | CP-T 48/10.0 | CP-T 48/20.0                                  |
|-----------------------------------------------------------|--------------------------------------|------------------------------------------------------------------|--------------|-----------------------------------------------|
| General data                                              |                                      |                                                                  |              |                                               |
| Efficiency                                                |                                      | typ. 91 %                                                        |              | typ. 93 %                                     |
| Duty cycle                                                |                                      | 100%                                                             |              |                                               |
| Dimensions                                                |                                      | see “Dimensional drawings”                                       |              |                                               |
| 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)                                            |              | 0.2-4 mm² (24-11 AWG) / 0.5-10 mm² (20-8 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 (9 lb.in) / 0.6 Nm (5.5 lb.in)                              |              | 1 Nm (9 lb.in) / 1.8 Nm (15.6 lb.in)          |
| Environmental data                                        |                                      |                                                                  |              |                                               |
| Ambient temperature range                                 | operation                            | -40...+70 °C                                                     | -30...+70 °C | -40...+70 °C                                  |
|                                                           | rated load                           | -40...+60 °C                                                     | -30...+60 °C | -40...+60 °C                                  |
|                                                           | storage                              | -40...+85 °C                                                     | -40...+85 °C | -40...+85 °C                                  |
| Altitude during operation                                 | IEC/EN 60068-2-13                    | max. 5000 m                                                      |              |                                               |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                    |                                      | 95 % without condensation                                        |              |                                               |
| Vibration (sinusoidal) (IEC/EN 60068-2-6)                 |                                      | 10-500 Hz, 2G, each along X, Y, Z axes 6 min / cycle             |              |                                               |
| Shock (half-sine) (IEC/EN 60068-2-27)                     |                                      | 15G, 11 ms, 3 axes, 6 Faces, 3 times for each face               |              |                                               |
| Isolation data                                            |                                      |                                                                  |              |                                               |
| Rated insulation voltage U <sub>i</sub>                   | input circuit / output circuit       | 3 kV AC                                                          |              |                                               |
|                                                           | input / PE                           | 1.5 kV AC                                                        |              |                                               |
|                                                           | output / PE                          | 0.5 kV AC; 0.71 kV DC                                            |              |                                               |
| Pollution degree                                          |                                      | 2                                                                |              |                                               |
| Standards / Directives                                    |                                      |                                                                  |              |                                               |
| Standards                                                 |                                      | IEC/EN 60950-1                                                   |              |                                               |
| Low Voltage Directive                                     |                                      | 2014/35/EU                                                       |              |                                               |
| EMC Directive                                             |                                      | 2014/30/EU                                                       |              |                                               |
| RoHS Directive                                            |                                      | 2011/65/EU                                                       |              |                                               |
| Protective low voltage                                    |                                      | SELV (IEC/EN 60950-1)                                            |              |                                               |
| Electromagnetic compatibility                             |                                      |                                                                  |              |                                               |
| Interference immunity to                                  |                                      | IEC/EN 61000-6-2                                                 |              |                                               |
| electrostatic discharge                                   | IEC/EN 61000-4-2                     | level 4 (air discharge 15 kV / contact discharge 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 / 5 kHz)                                           |              |                                               |
| surge                                                     | IEC/EN 61000-4-5                     | L-L level 3 (2 kV) / L-PE level 4 (4 kV)                         |              |                                               |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6                     | level 3 (10 V)                                                   |              |                                               |
| power frequency magnetic fields                           | IEC/EN 61000-4-8                     | level 4 (30 A/m)                                                 |              |                                               |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11                    | dips: >95 % 0.5 ms / >30 % 0.5 ms<br>interruptions: >95 % 250 ms |              |                                               |
| Interference emission                                     |                                      | IEC/EN 61000-6-3                                                 |              |                                               |
| high-frequency radiated                                   |                                      | class B                                                          |              |                                               |
| high-frequency conducted                                  |                                      | class B                                                          |              |                                               |
| limits for harmonic current emissions                     | IEC/EN 61000-3-2                     | class A                                                          |              |                                               |

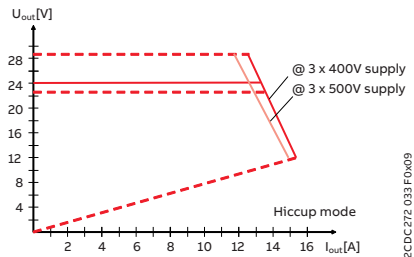
## CP-T range

### Technical diagrams

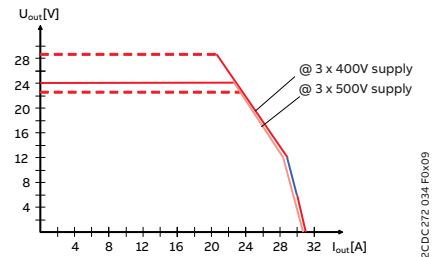
#### Output curves at $T_a = 25^\circ\text{C}$



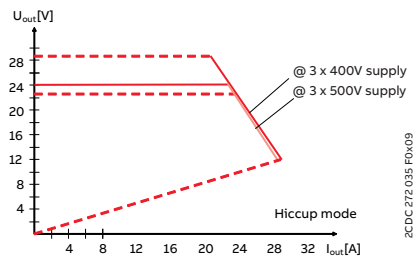
CP-T 24/5.0



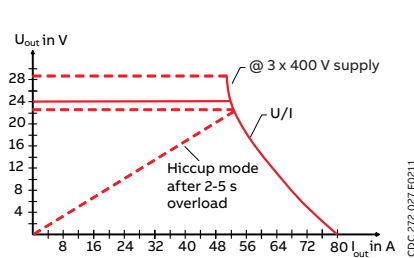
CP-T 24/10.0



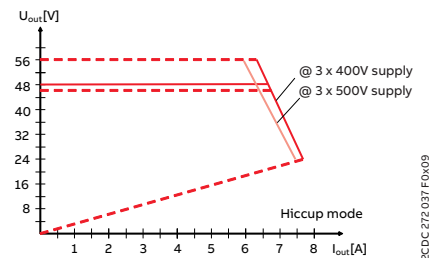
CP-T 24/20.0 U/I curve



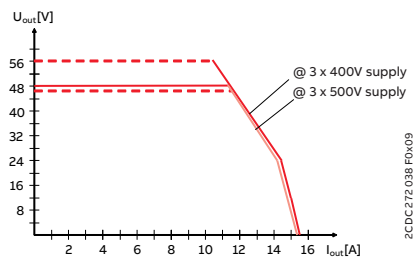
CP-T 24/20.0 Hiccup mode



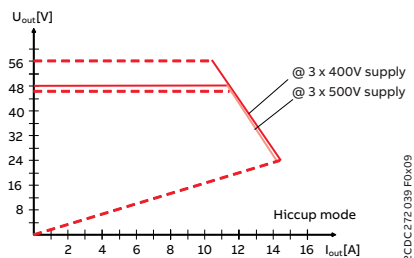
CP-T 24/40.0



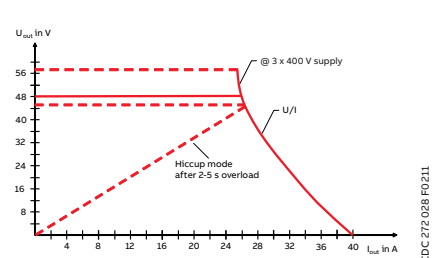
CP-T 48/5.0



CP-T 48/10.0 U/I curve

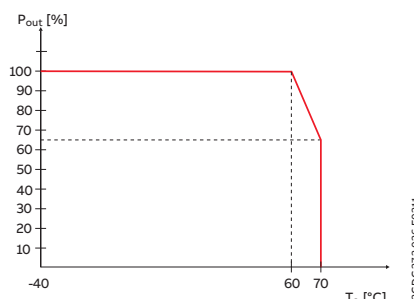


CP-T 48/10.0 Hiccup mode

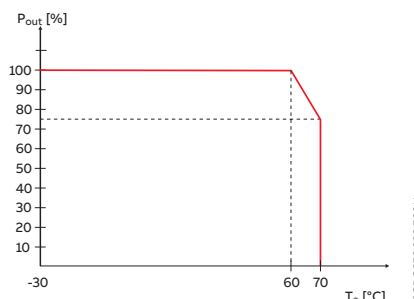


CP-T 48/20.0

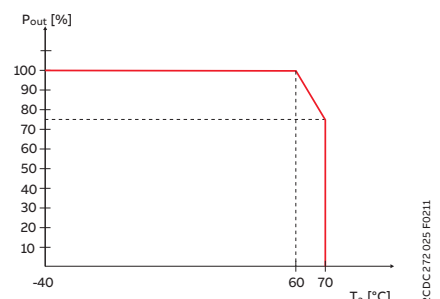
#### Temperature curves at rated load



CP-T 24/40.0, CP-T 48/20.0



CP-T 24/20.0, CP-T 48/10.0



CP-T 24/5.0, CP-T 24/10.0, CP-T 48/5.0

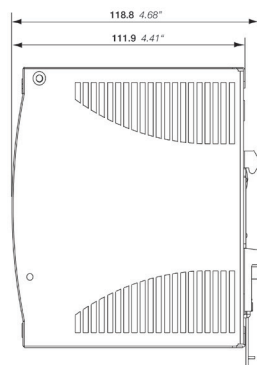


## CP-T range

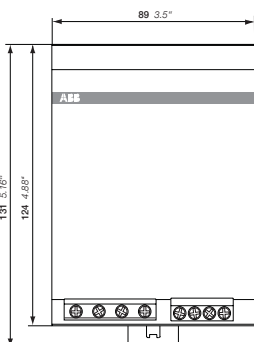
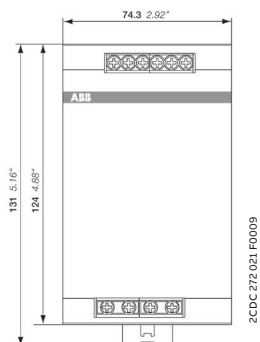
### Technical diagrams

#### Dimensional drawings

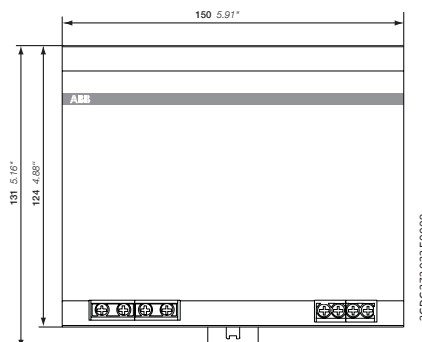
Dimensions in mm, inches



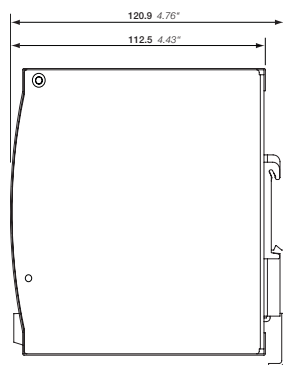
CP-T 24/5.0



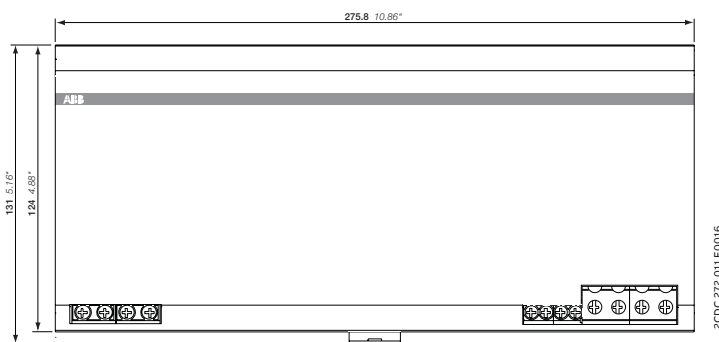
CP-T 24/10.0, CP-T 48/5.0



CP-T 24/20.0, CP-T 48/10.0



CP-T 24/40.0, CP-T 48/20.0







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## **CP-C.1 range**

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## CP-C.1 range

### Benefits and advantages



The high-performance CP-C.1 power supplies are ABB's most advanced range. With excellent efficiency, high reliability and innovative functionality, it is ready to take on the most demanding of industrial applications. These power supplies have a 150 % integrated power reserve, operate at an efficiency of up to 94 % and are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, CP-C.1 power supplies are the preferred choice for professional DC applications. ATEX and IECEx approvals are available for the use in hazardous areas.



#### Continuous operation

- Power reserve design to allow performance with up to 150 % more current
- Redundancy setup of the application possible to allow parallel operation
- Long lifetime
- High peak currents for switching on capacitive loads are supported



#### Project cost reduction

- Up to 94 % efficiency saves money for energy during operation
- Less need for external cooling in the cabinet
- Small size to reduce space needed in panel



#### Reliable in harsh conditions

- Extended ambient temperature range during operation -40...+70 °C with coated PCBA version
- IECEx/ATEX approvals for hazardous locations available
- High MTBF values



## CP-C.1 range

### Benefits and advantages



#### Characteristics

- Rated output voltage 24 V DC
- Power reserve design delivers up to 150 % at  $T_a \leq 40^\circ\text{C}$
- Output voltage adjustable via front-facing rotary potentiometer "OUTPUT Adjust", 22.5-28.5 V
- High efficiency of up to 94 %
- Low power dissipation and low heating
- Free convection cooling (no forced cooling)
- Devices with coated PCBAs for harsh environments and with extended temperature range
- Open-circuit, overload and short-circuit stable
- Integrated input fuse
- OUTPUT OK - signaling output "13-14" (relay), Power reserve signaling output " $I > I_R$ " (transistor)
- Redundancy unit offers true redundancy, available as accessory
- Various approvals and marks



#### Main benefits

The primary switch mode power supply CP-C.1 has a wide range of AC and DC input voltages. Furthermore, the CP-C.1 is equipped with capacitors that ensure a hold-up time of at least 50 ms. This enables worldwide usage and permits safe operation in fluctuating networks and battery-powered applications.

With their robust metallic housing and the reliable construction, CP-C.1 power supplies are suitable for applications in industrial environments. The CP-C.1-C units have coated PCBAs, which enables their use in harsh industrial environments. The power reserve of up to 150 % enables trouble-free starting of heavy loads eliminating the need for an oversized power supply.

#### Signaling output

To communicate the status of the power supply, the CP-C.1 is equipped with a relay output to signal OUTPUT OK as well as a transistor output  $I > I_R$  to indicate when the power reserve is active. These signals can be used for communication with a higher level control system, e.g. a PLC.

Depending on the logic of the higher level control system, an appropriate action is initiated by forwarding the signal. The receptor of this signal could be a contactor, a signal tower, or an interface relay.

## CP-C.1 range

### Operating controls

13-14: Relay output  
to signal 'Output OK'

$I > I_R$ :  
Power reserve  
transistor output  
to signal 'Power  
reserve is active'

Side mounting  
screw holes  
for DIN rail adapter /  
lateral mounting

OUTPUT L+, L-:  
Output  
terminals 24 V DC

Indication of  
operational states  
OUTPUT OK:  
Green LED  
POWER RESERVE  
 $I > I_R$ :  
Yellow LED

Circuit diagram

**OUTPUT Adjust:**  
Rotary potentiometer -  
Adjustment of output  
voltage 22.5-28.5 V DC

**INPUT L(+), N(-), PE:**  
Input terminals  
85-264 V AC /  
90 - 300 V DC



# CP-C.1 range

## Applications



### Application

The primary switch mode power supply CP-C.1 has a wide range of AC and DC input voltages. Furthermore, the CP-C.1 is equipped with capacitors that ensure a hold-up time of at least 50 ms. This enables worldwide usage and permits safe operation in fluctuating networks and battery-powered applications. With their robust metallic housing and reliable construction, CP-C.1 power supplies are suitable for applications in industrial environments. The CP-C.1-C units have coated PCBAs, which enables their use in the harshest of industrial environments. usage in even harsh industrial environments. The power reserve of up to 150 % enables trouble-free starting of heavy loads eliminating the need for an oversized power supply.



### Adjustable output voltage

The CP-C.1 range power supplies feature a continuously adjustable output voltage of 22.5 to 28.5 V DC. Thus, they can be optimally adapted to the applications, e.g. compensating the voltage drop caused by a long line length.



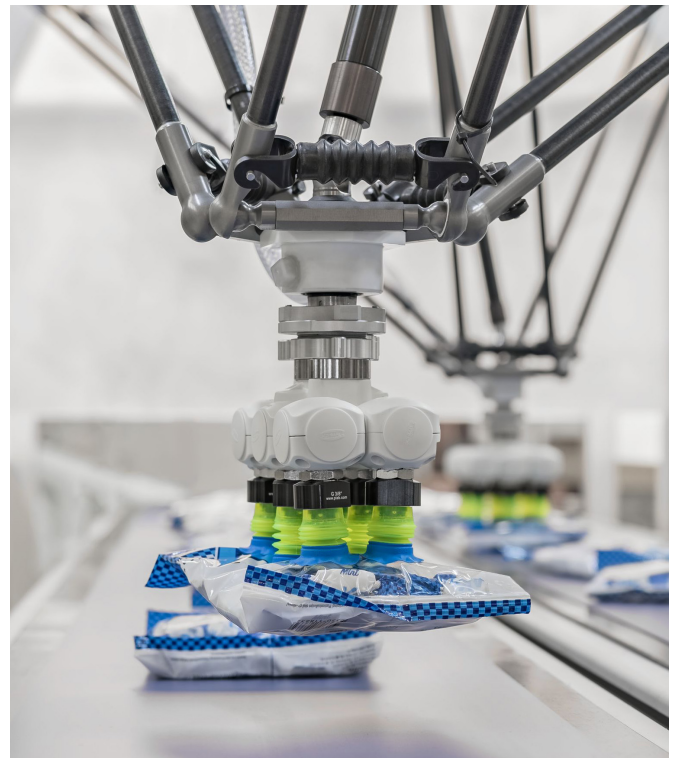
### Signaling output

To communicate the status of the power supply, the CP-C.1 is equipped with a relay output to signal OUTPUT OK as well as a transistor output  $I > I_R$  to indicate when the power reserve is active. These signals can be used for communication with a higher level control system, e.g. a PLC.



### Power reserve

The primary switch mode power supply CP-C.1 is equipped with a power reserve functionality to handle the start-up of particularly heavy loads (e.g. of a capacitive load or a motor). To ensure that heavy loads are started up, the CP-C.1 delivers additionally up to 150 % of the rated output current to secure the operation of the application. This status is displayed by the yellow LED labelled POWER RESERVE  $I > I_R$ .



## CP-C.1 range

### Ordering details



2CDC271009 F0017

CP-C.1 24/5.0  
CP-C.1 24/5.0-C



2CDC271010 V0017

CP-C.1 24/10.0  
CP-C.1 24/10.0-C



2CDC271011 V0017

CP-C.1 24/20.0  
CP-C.1 24/20.0-C



CP-C.1 24/5.0  
light grey



CP-C.1 24/10.0  
light grey

#### Description

High-performance CP-C.1 power supplies are ABB's most advanced range. With excellent efficiency, high reliability, and innovative functionality, it is ready to take on the most demanding industrial applications. These power supplies have up to 50 % integrated power reserve and operate at an efficiency of up to 94 %. They are equipped with overheat protection and active power factor correction. Combined with a broad AC and DC input range and extensive worldwide approvals, the CP-C.1 power supplies are the preferred choice for professional DC applications.

#### Ordering details - CP-C.1

| Input voltage range      | Rated output voltage / current | PCBA     | Color      | Type             | Order code      | Weight (1 pc.) kg (lb) |
|--------------------------|--------------------------------|----------|------------|------------------|-----------------|------------------------|
| 85-264 V AC, 90-300 V DC | 24 V DC / 5 A                  | uncoated | dark grey  | CP-C.1 24/5.0    | 1SVR360563R1001 | 0.87 (1.92)            |
|                          | 24 V DC / 10 A                 |          |            | CP-C.1 24/10.0   | 1SVR360663R1001 | 1.21 (2.67)            |
|                          | 24 V DC / 20 A                 |          |            | CP-C.1 24/20.0   | 1SVR360763R1001 | 1.70 (3.75)            |
|                          | 24 V DC / 5 A                  | coated   |            | CP-C.1 24/5.0-C  | 1SVR360563R2001 | 0.87 (1.92)            |
|                          | 24 V DC / 10 A                 |          |            | CP-C.1 24/10.0-C | 1SVR360663R2001 | 1.24 (2.73)            |
|                          | 24 V DC / 20 A                 |          |            | CP-C.1 24/20.0-C | 1SVR360763R2001 | 1.72 (3.79)            |
|                          | 24 V DC / 5 A                  | uncoated | light grey | CP-C.1 24/5.0-L  | 1SVR361563R1001 | 0.87 (1.92)            |
|                          | 24 V DC / 10 A                 |          |            | CP-C.1 24/10.0-L | 1SVR361663R1001 | 1.21 (2.67)            |
|                          | 24 V DC / 20 A                 |          |            | CP-C.1 24/20.0-L | 1SVR361763R1001 | 1.70 (3.75)            |

## CP-C.1 range

### Technical data

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

| Type                                                   |                                                        | CP-C.1 24/5.0, CP-C.1 24/5.0-L                                                            | CP-C.1 24/5.0-C                |
|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------|
| Input circuit - Supply circuit                         |                                                        |                                                                                           |                                |
|                                                        |                                                        | L (+), N (-)                                                                              |                                |
| Rated input voltage U <sub>in</sub>                    |                                                        | 100-240 V AC, 90-300 V DC                                                                 |                                |
| Input voltage range                                    | AC                                                     | 85-264 V AC                                                                               |                                |
|                                                        | DC                                                     | 90-300 V DC                                                                               |                                |
| Typical input current                                  | at 115 V AC                                            | 1.1 A                                                                                     |                                |
|                                                        | at 230 V AC                                            | 0.6 A                                                                                     |                                |
| Typical power consumption                              | at 230 V AC                                            | 132 W                                                                                     |                                |
| Rated frequency                                        |                                                        | DC, 50/60 Hz                                                                              |                                |
| Frequency range                                        | AC                                                     | 45-65 Hz                                                                                  |                                |
| Inrush current, cold state                             |                                                        | < 8 A                                                                                     |                                |
| Let-through energy I <sup>2</sup> t , cold state       | at 230 V AC                                            | < 1 A²s                                                                                   |                                |
| Discharge current towards PE                           |                                                        | < 3.5 mA                                                                                  |                                |
| Hold-up time                                           | at 115 V AC                                            | min. 50 ms                                                                                |                                |
|                                                        | at 230 V AC                                            | min. 50 ms                                                                                |                                |
| Internal input fuse                                    |                                                        | T4.0 A, not exchangeable                                                                  |                                |
| Recommended backup fuse for wire protection at 1.5 mm² |                                                        | 1 pole miniature circuit breaker ABB type S 200                                           |                                |
|                                                        | characteristic                                         | B or C                                                                                    |                                |
|                                                        | max. rating                                            | 16 A                                                                                      |                                |
| Power factor correction (PFC)                          |                                                        | yes, active                                                                               |                                |
| Transient overvoltage protection                       |                                                        | yes, varistor                                                                             |                                |
| User interface                                         |                                                        |                                                                                           |                                |
| Indication of operational states                       |                                                        |                                                                                           |                                |
| Output voltage                                         | LED 'OUTPUT OK ' (green)                               | ON                                                                                        | 92 % adjusted U <sub>out</sub> |
|                                                        |                                                        | flashing                                                                                  | 90 % adjusted U <sub>out</sub> |
| Power reserve                                          | LED 'I > I <sub>R</sub> ' (yellow)                     | OFF                                                                                       | I ≤ I <sub>R</sub>             |
|                                                        |                                                        | ON                                                                                        | I > I <sub>R</sub>             |
| Output circuit - Power output                          |                                                        |                                                                                           |                                |
|                                                        |                                                        | L+, L-                                                                                    |                                |
| Rated output voltage                                   |                                                        | 24 V DC                                                                                   |                                |
| Tolerance of the output voltage                        |                                                        | ± 1 %                                                                                     |                                |
| Adjustment range of the output voltage                 |                                                        | 22.5-28.5 V DC                                                                            |                                |
| Rated output power                                     |                                                        | 120 W                                                                                     |                                |
| Rated output current I <sub>R</sub>                    | - 25 °C ≤ T <sub>a</sub> ≤ 60 °C                       | 5.0 A                                                                                     | -                              |
|                                                        | - 40 °C ≤ T <sub>a</sub> ≤ 60 °C                       | -                                                                                         | 5.0 A                          |
| Reserve output current                                 | - 25 °C ≤ T <sub>a</sub> ≤ 40 °C                       | 7.5 A continuously                                                                        | -                              |
|                                                        | - 40 °C ≤ T <sub>a</sub> ≤ 40 °C                       | -                                                                                         | 7.5 A continuously             |
| Short-circuit current limiting                         |                                                        | 7.6 A                                                                                     |                                |
| Derating of the output current                         |                                                        | 60 °C < T <sub>a</sub> ≤ 70 °C 2.5 %/°C                                                   |                                |
| Deviation width of output voltage                      | static output voltage deviation 25-100 %               | < 1%, class C                                                                             |                                |
|                                                        | dynamical 0-100 %                                      | < 2%, class A                                                                             |                                |
|                                                        | change of input voltage within the rated input voltage | < 1 ms, class A                                                                           |                                |
| Recovery time T <sub>A</sub>                           |                                                        | < 1 ms, class A                                                                           |                                |
| Starting time after applying the supply voltage        |                                                        | < 500 ms, class C                                                                         |                                |
| Rise time                                              |                                                        | < 10 ms                                                                                   |                                |
| Residual ripple and switching peaks                    |                                                        | BW = 20 MHz < 120 mV <sub>pp</sub> , class A                                              |                                |
| Parallel connection                                    |                                                        | yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical |                                |
| Series connection                                      |                                                        | yes, max. 2 devices to increase voltage                                                   |                                |



## CP-C.1 range

### Technical data

| Type                                         |                                        | CP-C.1 24/5.0, CP-C.1 24/5.0-L                                                              | CP-C.1 24/5.0-C |
|----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------|-----------------|
| No-load, overload and short-circuit behavior |                                        |                                                                                             |                 |
| Characteristic curve of output               |                                        | U/I characteristic curve with power reserve                                                 |                 |
| Short-circuit protection                     |                                        | continuous short-circuit stability                                                          |                 |
| Short-circuit behavior                       |                                        | current limiting                                                                            |                 |
| Resistance to reverse feed                   |                                        | ≤ 35 V DC                                                                                   |                 |
| Overload protection                          |                                        | constant current limitation                                                                 |                 |
| Overtemperature protection                   |                                        | protection by switch off in case of overtemperature (thermal protection), automatic restart |                 |
| No-load protection                           |                                        | continuous no-load stability                                                                |                 |
| Starting of capacitive loads                 |                                        | yes                                                                                         |                 |
| Signaling outputs                            |                                        |                                                                                             |                 |
| OUTPUT OK signaling output                   |                                        |                                                                                             |                 |
| Type of output                               | 13-14                                  | relay, n/o contact                                                                          |                 |
| ON (contact closed)                          |                                        | 92 % adjusted U <sub>out</sub>                                                              |                 |
| OFF (contact open)                           |                                        | 90 % adjusted U <sub>out</sub>                                                              |                 |
| Contact ratings                              | max. switching voltage / current       | 30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)                                            |                 |
|                                              | min. switching voltage / current       | 5 V DC / 1 mA                                                                               |                 |
| POWER RESERVE signaling output               |                                        |                                                                                             |                 |
| Type of output                               | I > I <sub>R</sub>                     | transistor, short-circuit proof                                                             |                 |
| Active / ON (closed)                         |                                        | I > I <sub>R</sub>                                                                          |                 |
| Inactive / OFF (open)                        |                                        | I ≤ I <sub>R</sub>                                                                          |                 |
| Ratings                                      | voltage/current                        | 24 V DC / ≤ 20 mA                                                                           |                 |
| General data                                 |                                        |                                                                                             |                 |
| Efficiency                                   | at rated output power                  | up to 93 %                                                                                  |                 |
| Power loss                                   | at rated output power                  | 12 W                                                                                        |                 |
|                                              | at 50% of rated output power           | 8 W                                                                                         |                 |
|                                              | at no load                             | < 3.6 W                                                                                     |                 |
| Duty cycle                                   |                                        | 100 %                                                                                       |                 |
| MTBF                                         | acc. to MIL 217 HDBK                   | on request                                                                                  |                 |
| Dimensions                                   |                                        | see “Dimensional drawings”                                                                  |                 |
| Material of housing                          | cover                                  | zinc-coated sheet-steel                                                                     |                 |
|                                              | housing shell                          | aluminium                                                                                   |                 |
|                                              | front                                  | plastic, PA6, V-0                                                                           |                 |
| Mounting                                     |                                        | DIN rail (IEC/EN 60715), snap-on mounting                                                   |                 |
| Mounting position                            |                                        | see “Mounting positions” in the data sheet                                                  |                 |
| Minimum distance to other units              | horizontal                             | 25 mm (0.98 in)                                                                             |                 |
|                                              | vertical                               | 25 mm (0.98 in)                                                                             |                 |
| Degree of protection (IEC/EN 60529)          | housing / terminals                    | IP20 / IP20                                                                                 |                 |
| Protection class (IEC/EN 61140)              |                                        | I                                                                                           |                 |
| Electrical connection                        |                                        |                                                                                             |                 |
| Input circuits (L(+), N(-), PE)              |                                        |                                                                                             |                 |
| Connecting capacity                          | rigid                                  | 0.5-4.0 mm <sup>2</sup> (20-10 AWG)                                                         |                 |
|                                              | fine-strand with(out) wire end ferrule | 0.5-2.5 mm <sup>2</sup> (20-12 AWG)                                                         |                 |
| Stripping length                             |                                        | 8 mm (0.315 in)                                                                             |                 |
| Tightening torque                            |                                        | 0.5 Nm (4.4 lb.in)                                                                          |                 |
| Recommended screw driver                     |                                        | PH1 / Ø 4.0 x 0.8 mm                                                                        |                 |
| Output circuits (L+, L+, L-, L-)             |                                        |                                                                                             |                 |
| Connecting capacity                          | rigid                                  | 0.5-4.0 mm <sup>2</sup> (20-10 AWG)                                                         |                 |
|                                              | fine-strand with(out) wire end ferrule | 0.5-2.5 mm <sup>2</sup> (20-12 AWG)                                                         |                 |
| Stripping length                             |                                        | 8 mm (0.315 in)                                                                             |                 |
| Tightening torque                            |                                        | 0.5 Nm (4.4 lb.in)                                                                          |                 |
| Recommended screw driver                     |                                        | PH1 / Ø 4.0 x 0.8 mm                                                                        |                 |

## CP-C.1 range

### Technical data

| Type                                                             |                                        | CP-C.1 24/5.0, CP-C.1 24/5.0-L                                                     | CP-C.1 24/5.0-C                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signaling output (13-14, I > IR)                                 |                                        |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |
| Connecting capacity                                              | rigid                                  | 0.5-4.0 mm² (20-10 AWG)                                                            |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | fine-strand with(out) wire end ferrule | 0.5-2.5 mm² (20-12 AWG)                                                            |                                                                                                                                                                                                                                                                                                                                                                |
| Stripping length                                                 |                                        | 8 mm (0.315 in)                                                                    |                                                                                                                                                                                                                                                                                                                                                                |
| Tightening torque                                                |                                        | 0.5 Nm (4.4 lb.in)                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
| Recommended screw driver                                         |                                        | PH1 / Ø 4.0 x 0.8 mm                                                               |                                                                                                                                                                                                                                                                                                                                                                |
| Maximum cable length (applicable for I>IR)                       |                                        | 30 m                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
| Environmental data                                               |                                        |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |
| Ambient temperature range                                        | operation                              | -25...+70 °C (-13... +158 °F)                                                      | -40...+70 °C (-40...+158 °F)                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | rated output power                     | -25...+60 °C (-13... +140 °F)                                                      | -40...+60 °C (-40...+140 °F)                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | storage                                | -40...+85 °C (-40...+185 °F)                                                       |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | transportation                         | -40...+85 °C (-40...+185 °F)                                                       |                                                                                                                                                                                                                                                                                                                                                                |
| Climatic class (IEC/EN 60721-3-1)                                | storage                                | 1K2 (-40...+85 °C / -40...+185 °F)                                                 |                                                                                                                                                                                                                                                                                                                                                                |
| Climatic class (IEC/EN 60721-3-2)                                | transportation                         | 2K2 (-40...+85 °C / -40...+185 °F)                                                 |                                                                                                                                                                                                                                                                                                                                                                |
| Climatic class (IEC/EN 60721-3-3)                                | operation                              | 3K3 (-25...+70 °C / -13...+158 °F)                                                 | 3K3 (-40...+70 °C / -40...+158 °F)                                                                                                                                                                                                                                                                                                                             |
| Damp heat, cyclic (IEC/EN 60068-2-30)                            |                                        | test Db: 55 °C, 2 cycles                                                           |                                                                                                                                                                                                                                                                                                                                                                |
| Vibration (IEC/EN 60068-2-6)                                     |                                        | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis   |                                                                                                                                                                                                                                                                                                                                                                |
| Shock, half-sine (IEC/EN 60068-2-27)                             |                                        | test Ea: 30 g, 6 ms, 3 pulses each axis;<br>bump 20 g, 11 ms, 100 pulses each axis |                                                                                                                                                                                                                                                                                                                                                                |
| Coated PCBA                                                      |                                        | no                                                                                 | yes                                                                                                                                                                                                                                                                                                                                                            |
| Gaseous corrosive environment withstand test (IEC/EN 60068-2-60) |                                        | -                                                                                  | testing method: 4<br>testing period: 21 days<br>ambient conditions: 25 °C, 75 % r.h.<br>air/volume change rate per hour: 3-6<br>sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3<br>- H2S ≥ 100 ± 10 ppb<br>- SO2/SO3 ≥ 300 ± 20 ppb<br>- Cl2 ≥ 100 ± 10 ppb<br>- NOx ≥ 1250 ± 20 ppb |
| Isolation data                                                   |                                        |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                |
| Rated impulse withstand voltage U <sub>imp</sub> (EN 50178)      | input circuit / output circuit         | 4 kV (1.2/50 µs)                                                                   |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | input circuit / PE                     | 4 kV (1.2/50 µs)                                                                   |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | input circuit / relay contact          | 4 kV (1.2/50 µs)                                                                   |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | output circuit / relay contact         | 0.5 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | relay contact / PE                     | 0.5 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | output circuit / PE                    | 0.5 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
| Rated insulation voltage U <sub>i</sub> (EN 50178)               | input circuit / output circuit         | 300 V                                                                              |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | input circuit / PE                     | 300 V                                                                              |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | input circuit / relay contact          | 300 V                                                                              |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | output circuit / relay contact         | 50 V                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | relay contact / PE                     | 50 V                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | output circuit / PE                    | 50 V                                                                               |                                                                                                                                                                                                                                                                                                                                                                |
| Overvoltage category (EN 50178)                                  | < 2000 m                               | III                                                                                |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | 2000...5000 m                          | II                                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
| Overvoltage category (IEC/EN 60950-1)                            | < 2000 m                               | II                                                                                 |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | 2000...5000 m                          | I                                                                                  |                                                                                                                                                                                                                                                                                                                                                                |
| Pollution degree                                                 |                                        | 2                                                                                  |                                                                                                                                                                                                                                                                                                                                                                |
| Protective separation (IEC/EN 60950-1)                           | input circuit / output circuit         | yes                                                                                |                                                                                                                                                                                                                                                                                                                                                                |
|                                                                  | input circuit / relay contact          | yes                                                                                |                                                                                                                                                                                                                                                                                                                                                                |

## CP-C.1 range

### Technical data

| Type                                                                                                                                            | CP-C.1 24/5.0, CP-C.1 24/5.0-L |                                                                        | CP-C.1 24/5.0-C |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------|-----------------|
| Standards / Directives                                                                                                                          |                                |                                                                        |                 |
| Standards                                                                                                                                       | IEC/EN 61204                   |                                                                        |                 |
| Low Voltage Directive                                                                                                                           | 2014/35/EU                     |                                                                        |                 |
| EMC Directive                                                                                                                                   | 2014/30/EU                     |                                                                        |                 |
| ATEX Directive                                                                                                                                  | -                              | 2014/34/EU                                                             |                 |
| RoHS Directive                                                                                                                                  | 2011/65/EU                     |                                                                        |                 |
| Electrical safety                                                                                                                               | IEC/EN 60950-1                 |                                                                        |                 |
| Industrial control equipment                                                                                                                    | UL 508 / CSA 22.2 No 107.1     |                                                                        |                 |
| Electronic equipment for use in power installations                                                                                             | EN 50178                       |                                                                        |                 |
| Protective extra low voltage                                                                                                                    | PELV (EN 50178)                |                                                                        |                 |
| Safety extra low voltage                                                                                                                        | SELV (IEC/EN 60950-1)          |                                                                        |                 |
| Limitation of harmonic line currents                                                                                                            | IEC/EN 61000-3-2               |                                                                        |                 |
| Electromagnetic compatibility                                                                                                                   |                                |                                                                        |                 |
| Low-voltage power supplies, d.c. output – Part 3:<br>Electromagnetic compatibility (EMC)                                                        | IEC/EN 61204-3                 |                                                                        |                 |
| Interference immunity to                                                                                                                        | IEC/EN 61000-6-2               |                                                                        |                 |
| electrostatic discharge (ESD)                                                                                                                   | IEC/EN 61000-4-2               | level 4, 8 kV / 15 kV (criterion A)                                    |                 |
| radiated, radio-frequency, electromagnetic field                                                                                                | IEC/EN 61000-4-3               | level 3, 10 V/m (criterion A)                                          |                 |
| electrical fast transient / burst                                                                                                               | IEC/EN 61000-4-4               | level 4, 4 kV / 2 kV (criterion A)                                     |                 |
| surge                                                                                                                                           | IEC/EN 61000-4-5               | level 4, L/N 2 kV (criterion A)<br>level 4, L,N/PE 4 kV ( criterion A) |                 |
| conducted disturbances, induced by radio-frequency fields                                                                                       | IEC/EN 61000-4-6               | level 3, 10 V (criterion A)                                            |                 |
| voltage dips, short interruptions and voltage variations                                                                                        | IEC/EN 61000-4-11              | class 3                                                                |                 |
| harmonics and interharmonics                                                                                                                    | IEC/EN 61000-4-13              | class 3 (criterion A)                                                  |                 |
| conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz                                                                      | IEC/EN 61000-4-16              | level 3, 10 V                                                          |                 |
| Interference emission                                                                                                                           | IEC/EN 61000-6-3               |                                                                        |                 |
| limits for harmonic current emissions                                                                                                           | IEC/EN 61000-3-2               | class A                                                                |                 |
| limitation of voltage changes etc.                                                                                                              | IEC/EN 61000-3-3               | compliant                                                              |                 |
| Information technology equipment radio disturbance characteristics limits and methods of measurement                                            | IEC/CISPR 22, EN 55022         | class B                                                                |                 |
| Industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement | IEC/CISPR 11, EN 55011         | class B                                                                |                 |
| Voltage sags                                                                                                                                    | SEMI F47                       | passed                                                                 |                 |
| Federal Communications Commission                                                                                                               | FCC15                          | compliant                                                              |                 |

## CP-C.1 range

### Technical data

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

| Type                                                   | CP-C.1 24/10.0, CP-C.1 24/10.0-L                       |                                                                                           | CP-C.1 24/10.0-C               |
|--------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------|
| Input circuit - Supply circuit                         |                                                        |                                                                                           |                                |
|                                                        |                                                        | L (+), N (-)                                                                              |                                |
| Rated input voltage U <sub>in</sub>                    |                                                        | 100-240 V AC, 90-300 V DC                                                                 |                                |
| Input voltage range                                    | AC                                                     | 85-264 V AC                                                                               |                                |
|                                                        | DC                                                     | 90-300 V DC                                                                               |                                |
| Typical input current                                  | at 115 V AC                                            | 2.3 A                                                                                     |                                |
|                                                        | at 230 V AC                                            | 1.2 A                                                                                     |                                |
| Typical power consumption                              | at 230 V AC                                            | 256 W                                                                                     |                                |
| Rated frequency                                        |                                                        | DC, 50/60 Hz                                                                              |                                |
| Frequency range                                        | AC                                                     | 45-65 Hz                                                                                  |                                |
| Inrush current, cold state                             |                                                        | < 11 A                                                                                    |                                |
| Let-through energy I <sup>2</sup> t , cold state       | at 230 V AC                                            | < 1,5 A²s                                                                                 |                                |
| Discharge current towards PE                           |                                                        | < 3.5 mA                                                                                  |                                |
| Hold-up time                                           | at 115 V AC                                            | min. 40 ms                                                                                |                                |
|                                                        | at 230 V AC                                            | min. 40 ms                                                                                |                                |
| Internal input fuse                                    |                                                        | T6.3 A, not exchangeable                                                                  |                                |
| Recommended backup fuse for wire protection at 1.5 mm² |                                                        | 1 pole miniature circuit breaker ABB type S 200                                           |                                |
|                                                        | characteristic                                         | B or C                                                                                    |                                |
|                                                        | max. rating                                            | 16 A                                                                                      |                                |
| Power factor correction (PFC)                          |                                                        | yes, active                                                                               |                                |
| Transient overvoltage protection                       |                                                        | yes, varistor                                                                             |                                |
| User interface                                         |                                                        |                                                                                           |                                |
| Indication of operational states                       |                                                        |                                                                                           |                                |
| Output voltage                                         | LED 'OUTPUT OK ' (green)                               | ON                                                                                        | 92 % adjusted U <sub>out</sub> |
|                                                        |                                                        | flashing                                                                                  | 90 % adjusted U <sub>out</sub> |
| Power reserve                                          | LED 'I > I <sub>R</sub> ' (yellow)                     | OFF                                                                                       | I ≤ I <sub>R</sub>             |
|                                                        |                                                        | ON                                                                                        | I > I <sub>R</sub>             |
| Output circuit - Power output                          |                                                        |                                                                                           |                                |
|                                                        |                                                        | L+, L-                                                                                    |                                |
| Rated output voltage                                   |                                                        | 24 V DC                                                                                   |                                |
| Tolerance of the output voltage                        |                                                        | ±1 %                                                                                      |                                |
| Adjustment range of the output voltage                 |                                                        | 22.5-28.5 V DC                                                                            |                                |
| Rated output power                                     |                                                        | 240 W                                                                                     |                                |
| Rated output current I <sub>R</sub>                    | - 25 °C ≤ T <sub>a</sub> ≤ 60 °C                       | 10.0 A                                                                                    | -                              |
|                                                        | - 40 °C ≤ T <sub>a</sub> ≤ 60 °C                       | -                                                                                         | 10.0 A                         |
| Reserve output current                                 | - 25 °C ≤ T <sub>a</sub> ≤ 40 °C                       | 15.0 A continuously                                                                       | -                              |
|                                                        | - 40 °C ≤ T <sub>a</sub> ≤ 60 °C                       | -                                                                                         | 15.0 A continuously            |
| Short-circuit current limiting                         |                                                        | 15.5 A                                                                                    | 15.5 A                         |
| Derating of the output current                         | 60 °C < T <sub>a</sub> ≤ 70 °C                         | 2.5 %/°C                                                                                  | 2.5 %/°C                       |
| Deviation width of output voltage                      | static output voltage deviation 25-100 %               | < 1%, class C                                                                             |                                |
|                                                        | dynamic 0-100 %                                        | < 5 %, class B                                                                            |                                |
|                                                        | change of input voltage within the rated input voltage | < 1 ms, class A                                                                           |                                |
| Recovery time T <sub>A</sub>                           |                                                        | < 1 ms, class A                                                                           |                                |
| Starting time after applying the supply voltage        |                                                        | < 500 ms, class C                                                                         |                                |
| Rise time                                              |                                                        | < 10 ms                                                                                   |                                |
| Residual ripple and switching peaks                    | BW = 20 MHz                                            | < 120 mV <sub>pp</sub> , class A                                                          |                                |
| Parallel connection                                    |                                                        | yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical |                                |
| Series connection                                      |                                                        | yes, max. 2 devices to increase voltage                                                   |                                |

## CP-C.1 range

### Technical data

| Type                                         |                                        | CP-C.1 24/10.0, CP-C.1 24/10.0-L                                                            | CP-C.1 24/10.0-C |
|----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------|------------------|
| No-load, overload and short-circuit behavior |                                        |                                                                                             |                  |
| Characteristic curve of output               |                                        | U/I characteristic curve with power reserve                                                 |                  |
| Short-circuit protection                     |                                        | continuous short-circuit stability                                                          |                  |
| Short-circuit behavior                       |                                        | current limiting                                                                            |                  |
| Resistance to reverse feed                   |                                        | ≤ 35 V DC                                                                                   |                  |
| Overload protection                          |                                        | constant current limitation                                                                 |                  |
| Overtemperature protection                   |                                        | protection by switch off in case of overtemperature (thermal protection), automatic restart |                  |
| No-load protection                           |                                        | continuous no-load stability                                                                |                  |
| Starting of capacitive loads                 |                                        | yes                                                                                         |                  |
| Signaling outputs                            |                                        |                                                                                             |                  |
| OUTPUT OK signaling output                   |                                        |                                                                                             |                  |
| Type of output                               | 13-14                                  | relay, n/o contact                                                                          |                  |
| ON (contact closed)                          |                                        | 92 % adjusted U <sub>out</sub>                                                              |                  |
| OFF (contact open)                           |                                        | 90 % adjusted U <sub>out</sub>                                                              |                  |
| Contact ratings                              | max. switching voltage / current       | 30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)                                            |                  |
|                                              | min. switching voltage / current       | 5 V DC / 1 mA                                                                               |                  |
| POWER RESERVE signaling output               |                                        |                                                                                             |                  |
| Type of output                               | I > I <sub>R</sub>                     | transistor, short-circuit proof                                                             |                  |
| Active / ON (closed)                         |                                        | I > I <sub>R</sub>                                                                          |                  |
| Inactive / OFF (open)                        |                                        | I ≤ I <sub>R</sub>                                                                          |                  |
| Ratings                                      | voltage/current                        | 24 V DC / ≤ 20 mA                                                                           |                  |
| General data                                 |                                        |                                                                                             |                  |
| Efficiency                                   | at rated output power                  | up to 94 %                                                                                  |                  |
| Power loss                                   | at rated output power                  | 16 W                                                                                        |                  |
|                                              | at 50% of rated output power           | 12 W                                                                                        |                  |
|                                              | at no load                             | < 3.6 W                                                                                     |                  |
| Duty cycle                                   |                                        | 100 %                                                                                       |                  |
| MTBF                                         | acc. to MIL 217 HDBK                   | on request                                                                                  |                  |
| Dimensions                                   |                                        | see “Dimensional drawings”                                                                  |                  |
| Material of housing                          | cover                                  | zinc-coated sheet-steel                                                                     |                  |
|                                              | housing shell                          | aluminium                                                                                   |                  |
|                                              | front                                  | plastic, PA6, V-0                                                                           |                  |
| Mounting                                     |                                        | DIN rail (IEC/EN 60715), snap-on mounting                                                   |                  |
| Mounting position                            |                                        | see “Mounting positions” in the data sheet                                                  |                  |
| Minimum distance to other units              | horizontal                             | 25 mm (0.98 in)                                                                             |                  |
|                                              | vertical                               | 25 mm (0.98 in)                                                                             |                  |
| Degree of protection (IEC/EN 60529)          | housing / terminals                    | IP20 / IP20                                                                                 |                  |
| Protection class (IEC/EN 61140)              |                                        | I                                                                                           |                  |
| Electrical connection                        |                                        |                                                                                             |                  |
| Input circuits (L(+), N(-), PE)              |                                        |                                                                                             |                  |
| Connecting capacity                          | rigid                                  | 0.5-4.0 mm² (20-10 AWG)                                                                     |                  |
|                                              | fine-strand with(out) wire end ferrule | 0.5-2.5 mm² (20-12 AWG)                                                                     |                  |
| Stripping length                             |                                        | 8 mm (0.315 in)                                                                             |                  |
| Tightening torque                            |                                        | 0.5 Nm (4.4 lb.in)                                                                          |                  |
| Recommended screw driver                     |                                        | PH1 / Ø 4.0 x 0.8 mm                                                                        |                  |
| Output circuits (L+, L+, L-, L-)             |                                        |                                                                                             |                  |
| Connecting capacity                          | rigid                                  | 0.5-4.0 mm² (20-10 AWG)                                                                     |                  |
|                                              | fine-strand with(out) wire end ferrule | 0.5-2.5 mm² (20-12 AWG)                                                                     |                  |
| Stripping length                             |                                        | 8 mm (0.315 in)                                                                             |                  |
| Tightening torque                            |                                        | 0.5 Nm (4.4 lb.in)                                                                          |                  |
| Recommended screw driver                     |                                        | PH1 / Ø 4.0 x 0.8 mm                                                                        |                  |



## CP-C.1 range

### Technical data

| Type                                                             |                                        | CP-C.1 24/10.0, CP-C.1 24/10.0-L                                                 | CP-C.1 24/10.0-C                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Signaling output (13-14, I > IR)                                 |                                        |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                   |
| Connecting capacity                                              | rigid                                  | 0.5-4.0 mm <sup>2</sup> (20-10 AWG)                                              |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | fine-strand with(out) wire end ferrule | 0.5-2.5 mm <sup>2</sup> (20-12 AWG)                                              |                                                                                                                                                                                                                                                                                                                                                                   |
| Stripping length                                                 |                                        | 8 mm (0.315 in)                                                                  |                                                                                                                                                                                                                                                                                                                                                                   |
| Tightening torque                                                |                                        | 0.5 Nm (4.4 lb.in)                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
| Recommended screw driver                                         |                                        | PH1 / Ø 4.0 x 0.8 mm                                                             |                                                                                                                                                                                                                                                                                                                                                                   |
| Maximum cable length (applicable for I>I <sub>R</sub> )          |                                        | 30 m                                                                             |                                                                                                                                                                                                                                                                                                                                                                   |
| Environmental data                                               |                                        |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                   |
| Ambient temperature range                                        | operation                              | -25...+70 °C (-13...+158 °F)                                                     | -40...+70 °C (-40...+158 °F)                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | rated output power                     | -25...+60 °C (-13...+140 °F)                                                     | -40...+60 °C (-40...+140 °F)                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | storage                                | -40...+85 °C (-40...+185 °F)                                                     |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | transportation                         | -40...+85 °C (-40...+185 °F)                                                     |                                                                                                                                                                                                                                                                                                                                                                   |
| Climatic class (IEC/EN 60721-3-1)                                | storage                                | 1K2 (-40...+85 °C / -40...+185 °F)                                               |                                                                                                                                                                                                                                                                                                                                                                   |
| Climatic class (IEC/EN 60721-3-2)                                | transportation                         | 2K2 (-40...+85 °C / -40...+185 °F)                                               |                                                                                                                                                                                                                                                                                                                                                                   |
| Climatic class (IEC/EN 60721-3-3)                                | operation                              | 3K3 (-25...+70 °C / -13...+158 °F)                                               | 3K3 (-40...+70 °C / -40...+158 °F)                                                                                                                                                                                                                                                                                                                                |
| Damp heat, cyclic (IEC/EN 60068-2-30)                            |                                        | test Db: 55 °C, 2 cycles                                                         |                                                                                                                                                                                                                                                                                                                                                                   |
| Vibration (IEC/EN 60068-2-6)                                     |                                        | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis |                                                                                                                                                                                                                                                                                                                                                                   |
| Shock, half-sine (IEC/EN 60068-2-27)                             |                                        | test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis  |                                                                                                                                                                                                                                                                                                                                                                   |
| Coated PCBA                                                      |                                        | no                                                                               | yes                                                                                                                                                                                                                                                                                                                                                               |
| Gaseous corrosive environment withstand test (IEC/EN 60068-2-60) |                                        | -                                                                                | testing method: 4<br>testing period: 21 days<br>ambient conditions: 25 °C, 75 % r.h.<br>air/volume change rate per hour: 3-6<br>sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3<br>IEC 60721-3.3 acc. 3C2/3C3<br>- H2S ≥ 100 ± 10 ppb<br>- SO2/SO3 ≥ 300 ± 20 ppb<br>- Cl2 ≥ 100 ± 10 ppb<br>- NOx ≥ 1250 ± 20 ppb |
| Isolation data                                                   |                                        |                                                                                  |                                                                                                                                                                                                                                                                                                                                                                   |
| Rated impulse withstand voltage U <sub>imp</sub> (EN 50178)      | input circuit / output circuit         | 4 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | input circuit / PE                     | 4 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | input circuit / relay contact          | 4 kV (1.2/50 µs)                                                                 |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | output circuit / relay contact         | 0.5 kV (1.2/50 µs)                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | relay contact / PE                     | 0.5 kV (1.2/50 µs)                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | output circuit / PE                    | 0.5 kV (1.2/50 µs)                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
| Rated insulation voltage U <sub>i</sub> (EN 50178)               | input circuit / output circuit         | 300 V                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | input circuit / PE                     | 300 V                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | input circuit / relay contact          | 300 V                                                                            |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | output circuit / relay contact         | 50 V                                                                             |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | relay contact / PE                     | 50 V                                                                             |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | output circuit / PE                    | 50 V                                                                             |                                                                                                                                                                                                                                                                                                                                                                   |
| Overvoltage category (EN 50178)                                  | < 2000 m                               | III                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | 2000...5000 m                          | II                                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
| Overvoltage category (IEC/EN 60950-1)                            | < 2000 m                               | II                                                                               |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | 2000...5000 m                          | I                                                                                |                                                                                                                                                                                                                                                                                                                                                                   |
| Pollution degree                                                 |                                        | 2                                                                                |                                                                                                                                                                                                                                                                                                                                                                   |
| Protective separation (IEC/EN 60950-1)                           | input circuit / output circuit         | yes                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                  | input circuit / relay contact          | yes                                                                              |                                                                                                                                                                                                                                                                                                                                                                   |

## CP-C.1 range

### Technical data

| Type                                                                                                                                                  | CP-C.1 24/10.0, CP-C.1 24/10.0-L |                                                                       | CP-C.1 24/10.0-C |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------|------------------|
| Standards / Directives                                                                                                                                |                                  |                                                                       |                  |
| Standards                                                                                                                                             | IEC/EN 61204                     |                                                                       |                  |
| Low Voltage Directive                                                                                                                                 | 2014/35/EU                       |                                                                       |                  |
| EMC Directive                                                                                                                                         | 2014/30/EU                       |                                                                       |                  |
| ATEX Directive                                                                                                                                        | -                                | 2014/34/EU                                                            |                  |
| RoHS Directive                                                                                                                                        | 2011/65/EU                       |                                                                       |                  |
| Electrical safety                                                                                                                                     | IEC/EN 60950-1                   |                                                                       |                  |
| Industrial control equipment / General Use Power Supplies                                                                                             | UL 508 / CSA 22.2 No 107.1       |                                                                       |                  |
| Electronic equipment for use in power installations                                                                                                   | EN 50178                         |                                                                       |                  |
| Protective extra low voltage                                                                                                                          | PELV (EN 50178)                  |                                                                       |                  |
| Safety extra low voltage                                                                                                                              | SELV (IEC/EN 60950-1)            |                                                                       |                  |
| Limitation of harmonic line currents                                                                                                                  | IEC/EN 61000-3-2                 |                                                                       |                  |
| Electromagnetic compatibility                                                                                                                         |                                  |                                                                       |                  |
| Low-voltage power supplies, d.c. output – Part 3:<br>Electromagnetic compatibility (EMC)                                                              | IEC/EN 61204-3                   |                                                                       |                  |
| Interference immunity to                                                                                                                              | IEC/EN 61000-6-2                 |                                                                       |                  |
| electrostatic discharge (ESD)                                                                                                                         | IEC/EN 61000-4-2                 | level 4, 8 kV / 15 kV (criterion A)                                   |                  |
| radiated, radio-frequency, electromagnetic field                                                                                                      | IEC/EN 61000-4-3                 | level 3, 10 V/m (criterion A)                                         |                  |
| electrical fast transient / burst                                                                                                                     | IEC/EN 61000-4-4                 | level 4, 4 kV / 2 kV (criterion A)                                    |                  |
| surge                                                                                                                                                 | IEC/EN 61000-4-5                 | level 4, L/N 2 kV (criterion A)<br>level 4, L,N/PE 4 kV (criterion A) |                  |
| conducted disturbances, induced by radio-frequency fields                                                                                             | IEC/EN 61000-4-6                 | level 3, 10 V (criterion A)                                           |                  |
| voltage dips, short interruptions and voltage variations                                                                                              | IEC/EN 61000-4-11                | class 3                                                               |                  |
| harmonics and interharmonics                                                                                                                          | IEC/EN 61000-4-13                | class 3 (Criterion A)                                                 |                  |
| conducted, common mode disturbances in the frequency<br>range 0 Hz to 150 kHz                                                                         | IEC/EN 61000-4-16                | level 3, 10 V                                                         |                  |
| Interference emission                                                                                                                                 | IEC/EN 61000-6-3                 |                                                                       |                  |
| limits for harmonic current emissions                                                                                                                 | IEC/EN 61000-3-2                 | class A                                                               |                  |
| limitation of voltage changes etc.                                                                                                                    | IEC/EN 61000-3-3                 | compliant                                                             |                  |
| Information technology equipment radio disturbance<br>characteristics limits and methods of measurement                                               | IEC/CISPR 22,<br>EN 55022        | class B                                                               |                  |
| Industrial scientific and medical (ISM) radio-frequency<br>equipment electromagnetic disturbance characteristics<br>limits and methods of measurement | IEC/CISPR 11,<br>EN 55011        | class B                                                               |                  |
| Voltage sags                                                                                                                                          | SEMI F47                         | passed                                                                |                  |
| Federal Communications Commission                                                                                                                     | FCC15                            | compliant                                                             |                  |

## CP-C.1 range

### Technical data

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

| Type                                                   | CP-C.1 24/20.0, CP-C.1 24/20.0-L   |                                                                                           | CP-C.1 24/20.0-C                 |
|--------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------|
| Input circuit - Supply circuit                         |                                    |                                                                                           |                                  |
|                                                        |                                    | L (+), N (-)                                                                              |                                  |
| Rated input voltage U <sub>in</sub>                    |                                    | 100-240 V AC, 90-300 V DC                                                                 |                                  |
| Input voltage range                                    |                                    | AC                                                                                        | 85-264 V AC                      |
|                                                        |                                    | DC                                                                                        | 90-300 V DC                      |
| Typical input current                                  |                                    | at 115 V AC                                                                               | 4.6 A                            |
|                                                        |                                    | at 230 V AC                                                                               | 2.3 A                            |
| Typical power consumption                              |                                    | at 230 V AC                                                                               | 508 W                            |
| Rated frequency                                        |                                    | DC, 50/60 Hz                                                                              |                                  |
| Frequency range                                        |                                    | AC                                                                                        | 45-65 Hz                         |
| Inrush current, cold state                             |                                    | < 11 A                                                                                    |                                  |
| Let-through energy I²t , cold state                    |                                    | at 230 V AC                                                                               | < 3 A²s                          |
| Discharge current towards PE                           |                                    | < 3.5 mA                                                                                  |                                  |
| Hold-up time                                           |                                    | at 115 V AC                                                                               | min. 40 ms                       |
|                                                        |                                    | at 230 V AC                                                                               | min. 40 ms                       |
| Internal input fuse                                    |                                    | T12 A, not exchangeable                                                                   |                                  |
| Recommended backup fuse for wire protection at 1.5 mm² |                                    | 1 pole miniature circuit breaker ABB type S 200                                           |                                  |
|                                                        |                                    | characteristic                                                                            | B or C                           |
|                                                        |                                    | max. rating                                                                               | 16 A                             |
| Power factor correction (PFC)                          |                                    | yes, active                                                                               |                                  |
| Transient overvoltage protection                       |                                    | yes, varistor                                                                             |                                  |
| User interface                                         |                                    |                                                                                           |                                  |
| Indication of operational states                       |                                    |                                                                                           |                                  |
| Output voltage                                         | LED 'OUTPUT OK ' (green)           | ON                                                                                        | 92 % adjusted U <sub>out</sub>   |
|                                                        |                                    | flashing                                                                                  | 90 % adjusted U <sub>out</sub>   |
| Power reserve                                          | LED 'I > I <sub>R</sub> ' (yellow) | OFF                                                                                       | I ≤ I <sub>R</sub>               |
|                                                        |                                    | ON                                                                                        | I > I <sub>R</sub>               |
| Output circuit - Power output                          |                                    |                                                                                           |                                  |
|                                                        |                                    | L+, L-                                                                                    |                                  |
| Rated output voltage                                   |                                    | 24 V DC                                                                                   |                                  |
| Tolerance of the output voltage                        |                                    | ± 1 %                                                                                     |                                  |
| Adjustment range of the output voltage                 |                                    | 22.5-28.5 V DC                                                                            |                                  |
| Rated output power                                     |                                    | 480 W                                                                                     |                                  |
| Rated output current I <sub>R</sub>                    |                                    | - 25 °C ≤ T <sub>a</sub> ≤ 60 °C                                                          | 20 A                             |
|                                                        |                                    | - 40 °C ≤ T <sub>a</sub> ≤ 60 °C                                                          | -                                |
| Reserve output current                                 |                                    | - 25 °C ≤ T <sub>a</sub> ≤ 40 °C                                                          | 26.0 A continuously              |
|                                                        |                                    | - 40 °C ≤ T <sub>a</sub> ≤ 60 °C                                                          | -                                |
| Short-circuit current limiting                         |                                    | 27.7 A                                                                                    |                                  |
| Derating of the output current                         |                                    | 60 °C < T <sub>a</sub> ≤ 70 °C                                                            | 2.5 %/°C                         |
| Deviation width of output voltage                      |                                    | static output voltage deviation 25-100 %                                                  | < 1 %, class C                   |
|                                                        |                                    | dynamical 0-100 %                                                                         | < 5 %, class B                   |
|                                                        |                                    | change of input voltage within the rated input voltage                                    | < 5 ms, class B                  |
| Recovery time T <sub>A</sub>                           |                                    | < 1 ms, class A                                                                           |                                  |
| Starting time after applying the supply voltage        |                                    | < 500 ms, class C                                                                         |                                  |
| Rise time                                              |                                    | < 10 ms                                                                                   |                                  |
| Residual ripple and switching peaks                    |                                    | BW = 20 MHz                                                                               | < 120 mV <sub>pp</sub> , class A |
| Parallel connection                                    |                                    | yes, up to 5 devices, to enable redundancy and to increase power, current not symmetrical |                                  |
| Series connection                                      |                                    | yes, max. 2 devices to increase voltage                                                   |                                  |

## CP-C.1 range

### Technical data

| Type                                         |                                        | CP-C.1 24/20.0, CP-C.1 24/20.0-L                                                            | CP-C.1 24/20.0-C |
|----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------|------------------|
| No-load, overload and short-circuit behavior |                                        |                                                                                             |                  |
| Characteristic curve of output               |                                        | U/I characteristic curve with power reserve                                                 |                  |
| Short-circuit protection                     |                                        | continuous short-circuit stability                                                          |                  |
| Short-circuit behavior                       |                                        | current limiting                                                                            |                  |
| Resistance to reverse feed                   |                                        | ≤ 35 V DC                                                                                   |                  |
| Overload protection                          |                                        | constant current limitation                                                                 |                  |
| Overtemperature protection                   |                                        | protection by switch off in case of overtemperature (thermal protection), automatic restart |                  |
| No-load protection                           |                                        | continuous no-load stability                                                                |                  |
| Starting of capacitive loads                 |                                        | yes                                                                                         |                  |
| Signaling outputs                            |                                        |                                                                                             |                  |
| OUTPUT OK signaling output                   |                                        |                                                                                             |                  |
| Type of output                               | 13-14                                  | relay, n/o contact                                                                          |                  |
| ON (contact closed)                          |                                        | 92 % adjusted U <sub>out</sub>                                                              |                  |
| OFF (contact open)                           |                                        | 90 % adjusted U <sub>out</sub>                                                              |                  |
| Contact ratings                              | max. switching voltage / current       | 30 V AC - 0.5 A / 24 V DC - 1 A (resistive load)                                            |                  |
|                                              | min. switching voltage / current       | 5 V DC / 1 mA                                                                               |                  |
| POWER RESERVE signaling output               |                                        |                                                                                             |                  |
| Type of output                               | I > I <sub>R</sub>                     | transistor, short-circuit proof                                                             |                  |
| Active / ON (closed)                         |                                        | I > I <sub>R</sub>                                                                          |                  |
| Inactive / OFF (open)                        |                                        | I ≤ I <sub>R</sub>                                                                          |                  |
| Ratings                                      | voltage/current                        | 24 V DC / ≤ 20 mA                                                                           |                  |
| General data                                 |                                        |                                                                                             |                  |
| Efficiency                                   | at rated output power                  | up to 94 %                                                                                  |                  |
| Power loss                                   | at rated output power                  | 28 W                                                                                        |                  |
|                                              | at 50 % of rated output power          | 17 W                                                                                        |                  |
|                                              | at no load                             | < 3.6 W                                                                                     |                  |
| Duty cycle                                   |                                        | 100 %                                                                                       |                  |
| MTBF                                         | acc. to MIL 217 HDBK                   | on request                                                                                  |                  |
| Dimensions                                   |                                        | see “Dimensional drawings”                                                                  |                  |
| Material of housing                          | cover                                  | zinc-coated sheet-steel                                                                     |                  |
|                                              | housing shell                          | aluminium                                                                                   |                  |
|                                              | front                                  | plastic, PA6, V-0                                                                           |                  |
| Mounting                                     |                                        | DIN rail (IEC/EN 60715), snap-on mounting                                                   |                  |
| Mounting position                            |                                        | see “Mounting positions” in the data sheet                                                  |                  |
| Minimum distance to other units              | horizontal                             | 25 mm (0.98 in)                                                                             |                  |
|                                              | vertical                               | 25 mm (0.98 in)                                                                             |                  |
| Degree of protection (IEC/EN 60529)          | housing / terminals                    | IP20 / IP20                                                                                 |                  |
| Protection class (IEC/EN 61140)              |                                        | I                                                                                           |                  |
| Electrical connection                        |                                        |                                                                                             |                  |
| Input circuits (L(+), N(-), PE)              |                                        |                                                                                             |                  |
| Connecting capacity                          | rigid                                  | 0.5-4.0 mm² (20-10 AWG)                                                                     |                  |
|                                              | fine-strand with(out) wire end ferrule | 0.5-2.5 mm² (20-12 AWG)                                                                     |                  |
| Stripping length                             |                                        | 8 mm (0.315 in)                                                                             |                  |
| Tightening torque                            |                                        | 0.5 Nm (4.4 lb.in)                                                                          |                  |
| Recommended screw driver                     |                                        | PH1 / Ø 4.0 x 0.8 mm                                                                        |                  |

## CP-C.1 range

### Technical data

| Type                                                             | CP-C.1 24/20.0, CP-C.1 24/20.0-L                                                 |                                    | CP-C.1 24/20.0-C                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output circuits (L+, L+, L-, L-)                                 |                                                                                  |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Connecting capacity                                              | rigid                                                                            | 2.5-16.0 mm² (12-6 AWG)            |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | fine-strand with(out) wire end ferrule                                           | 2.5-10 mm² (12-8 AWG)              |                                                                                                                                                                                                                                                                                                                                                                      |
| Stripping length                                                 | 10 mm ( 0.394 in)                                                                |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Tightening torque                                                | 1.2 Nm (10.5 lb-in)                                                              |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Recommended screw driver                                         | PH1 / Ø 4.0 x 0.8 mm                                                             |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Signaling output (13-14, I > IR)                                 |                                                                                  |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Connecting capacity                                              | rigid                                                                            | 0.5-4.0 mm² (20-10 AWG)            |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | fine-strand with(out) wire end ferrule                                           | 0.5-2.5 mm² (20-12 AWG)            |                                                                                                                                                                                                                                                                                                                                                                      |
| Stripping length                                                 | 8 mm (0.315 in)                                                                  |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Tightening torque                                                | 0.5 Nm (4.4 lb.in)                                                               |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Recommended screw driver                                         | PH1 / Ø 4.0 x 0.8 mm                                                             |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Maximum cable length (applicable for I>I <sub>R</sub> )          | 30 m                                                                             |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Environmental data                                               |                                                                                  |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Ambient temperature range                                        | operation                                                                        | -25...+70 °C (-13...+158 °F)       | -40...+70 °C (-40...+158 °F)                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | rated output power                                                               | -25...+60 °C (-13...+140 °F)       | -40...+60 °C (-40...+140 °F)                                                                                                                                                                                                                                                                                                                                         |
|                                                                  | storage                                                                          | -40...+85 °C (-40...+185 °F)       |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | transportation                                                                   | -40...+85 °C (-40...+185 °F)       |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-1)                                | storage                                                                          | 1K2 (-40...+85 °C / -40...+185 °F) |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-2)                                | transportation                                                                   | 2K2 (-40...+85 °C / -40...+185 °F) |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-3)                                | operation                                                                        | 3K3 (-25...+70 °C / -13...+158 °F) | 3K3 (-40...+70 °C / -40... +158 °F)                                                                                                                                                                                                                                                                                                                                  |
| Damp heat, cyclic (IEC/EN 60068-2-30)                            | test Db: 55 °C, 2 cycles                                                         |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Vibration (IEC/EN 60068-2-6)                                     | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Shock, half-sine (IEC/EN 60068-2-27)                             | test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis  |                                    |                                                                                                                                                                                                                                                                                                                                                                      |
| Coated PCBA                                                      | no                                                                               |                                    | yes                                                                                                                                                                                                                                                                                                                                                                  |
| Gaseous corrosive environment withstand test (IEC/EN 60068-2-60) | -                                                                                |                                    | testing method: 4<br>testing period: 21 days<br>ambient conditions: 25 °C, 75 % r.h.<br>air/volume change rate per hour: 3-6<br>sample not energized during exposure<br>gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3<br>IEC 60721-3.3 acc. 3C2/3C3<br>- H2S ≥ 100 ± 10 ppb<br>- SO2/SO3 ≥ 300 ± 20 ppb<br>- Cl2 ≥ 100 ± 10 ppb<br>- NOx ≥ 1250 ± 20 ppb |

## CP-C.1 range

### Technical data

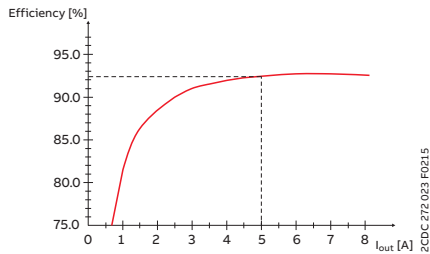
| Type                                                                                                                                            |                                | CP-C.1 24/20.0, CP-C.1 24/20.0-L                                      | CP-C.1 24/20.0-C |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------|------------------|
| Isolation data                                                                                                                                  |                                |                                                                       |                  |
| Rated impulse withstand voltage U <sub>imp</sub> (EN 50178)                                                                                     | input circuit / output circuit | 4 kV (1.2/50 μs)                                                      |                  |
|                                                                                                                                                 | input circuit / PE             | 4 kV (1.2/50 μs)                                                      |                  |
|                                                                                                                                                 | input circuit / relay contact  | 4 kV (1.2/50 μs)                                                      |                  |
|                                                                                                                                                 | output circuit / relay contact | 0.5 kV (1.2/50 μs)                                                    |                  |
|                                                                                                                                                 | relay contact / PE             | 0.5 kV (1.2/50 μs)                                                    |                  |
|                                                                                                                                                 | output circuit / PE            | 0.5 kV (1.2/50 μs)                                                    |                  |
| Rated insulation voltage U <sub>i</sub> (EN 50178)                                                                                              | input circuit / output circuit | 300 V                                                                 |                  |
|                                                                                                                                                 | input circuit / PE             | 300 V                                                                 |                  |
|                                                                                                                                                 | input circuit / relay contact  | 300 V                                                                 |                  |
|                                                                                                                                                 | output circuit / relay contact | 50 V                                                                  |                  |
|                                                                                                                                                 | relay contact / PE             | 50 V                                                                  |                  |
|                                                                                                                                                 | output circuit / PE            | 50 V                                                                  |                  |
| Overvoltage category (EN 50178)                                                                                                                 | < 2000 m                       | III                                                                   |                  |
|                                                                                                                                                 | 2000...5000 m                  | II                                                                    |                  |
| Overvoltage category (IEC/EN 60950-1)                                                                                                           | < 2000 m                       | II                                                                    |                  |
|                                                                                                                                                 | 2000...5000 m                  | I                                                                     |                  |
| Pollution degree                                                                                                                                |                                | 2                                                                     |                  |
| Protective separation (IEC/EN 60950-1)                                                                                                          | input circuit / output circuit | yes                                                                   |                  |
|                                                                                                                                                 | input circuit / relay contact  | yes                                                                   |                  |
| Standards / Directives                                                                                                                          |                                |                                                                       |                  |
| Standards                                                                                                                                       |                                | IEC/EN 61204                                                          |                  |
| Low Voltage Directive                                                                                                                           |                                | 2014/35/EU                                                            |                  |
| EMC Directive                                                                                                                                   |                                | 2014/30/EU                                                            |                  |
| ATEX Directive                                                                                                                                  |                                | -                                                                     | 2014/34/EU       |
| RoHS Directive                                                                                                                                  |                                | 2011/65/EU                                                            |                  |
| Electrical safety                                                                                                                               |                                | IEC/EN 60950-1                                                        |                  |
| Industrial control equipment / General Use Power Supplies                                                                                       |                                | UL 508 / CSA 22.2 No 107.1                                            |                  |
| Electronic equipment for use in power installations                                                                                             |                                | EN 50178                                                              |                  |
| Protective extra low voltage                                                                                                                    |                                | PELV (EN 50178)                                                       |                  |
| Safety extra low voltage                                                                                                                        |                                | SELV (IEC/EN 60950-1)                                                 |                  |
| Limitation of harmonic line currents                                                                                                            |                                | IEC/EN 61000-3-2                                                      |                  |
| Electromagnetic compatibility                                                                                                                   |                                |                                                                       |                  |
| Low-voltage power supplies, d.c. output – Part 3:<br>Electromagnetic compatibility (EMC)                                                        |                                | IEC/EN 61204-3                                                        |                  |
| Interference immunity to                                                                                                                        |                                | IEC/EN 61000-6-2                                                      |                  |
| electrostatic discharge (ESD)                                                                                                                   | IEC/EN 61000-4-2               | level 4, 8 kV / 15 kV (criterion A)                                   |                  |
| radiated, radio-frequency, electromagnetic field                                                                                                | IEC/EN 61000-4-3               | level 3, 10 V/m (criterion A)                                         |                  |
| electrical fast transient / burst                                                                                                               | IEC/EN 61000-4-4               | level 4, 4 kV / 2 kV (criterion A)                                    |                  |
| surge                                                                                                                                           | IEC/EN 61000-4-5               | level 4, L/N 2 kV (criterion A)<br>level 4, L,N/PE 4 kV (criterion A) |                  |
| conducted disturbances, induced by radio-frequency fields                                                                                       | IEC/EN 61000-4-6               | level 3, 10 V (criterion A)                                           |                  |
| voltage dips, short interruptions and voltage variations                                                                                        | IEC/EN 61000-4-11              | class 3                                                               |                  |
| harmonics and interharmonics                                                                                                                    | IEC/EN 61000-4-13              | class 3 (Criterion A)                                                 |                  |
| conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz                                                                      | IEC/EN 61000-4-16              | level 3, 10 V                                                         |                  |
| Interference emission                                                                                                                           |                                | IEC/EN 61000-6-3                                                      |                  |
| limits for harmonic current emissions                                                                                                           | IEC/EN 61000-3-2               | class A                                                               |                  |
| limitation of voltage changes etc.                                                                                                              | IEC/EN 61000-3-3               | compliant                                                             |                  |
| Information technology equipment radio disturbance characteristics limits and methods of measurement                                            | IEC/CISPR 22, EN 55022         | class B                                                               |                  |
| Industrial scientific and medical (ISM) radio-frequency equipment electromagnetic disturbance characteristics limits and methods of measurement | IEC/CISPR 11, EN 55011         | class B                                                               |                  |
| Voltage sags                                                                                                                                    | SEMI F47                       | passed                                                                |                  |
| Federal Communications Commission                                                                                                               | FCC15                          | compliant                                                             |                  |



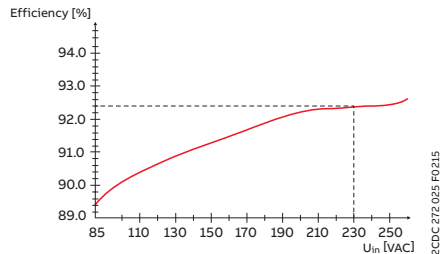
## CP-C.1 range

### Technical diagrams

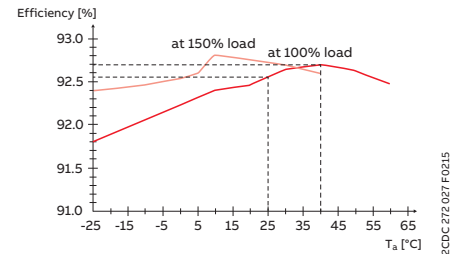
#### CP-C.1 24/5.0, CP-C.1 24/5.0-L and CP-C.1 24/5.0-C



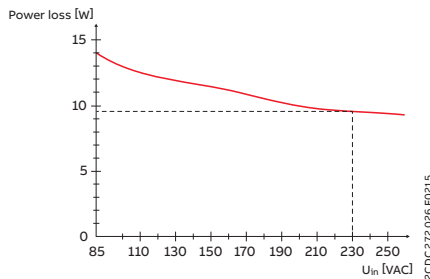
Typical efficiency over output current



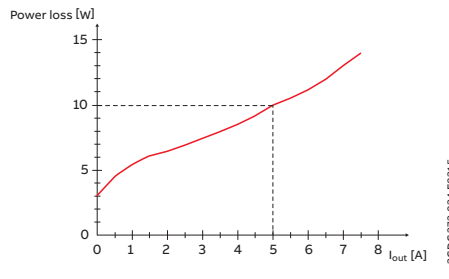
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature

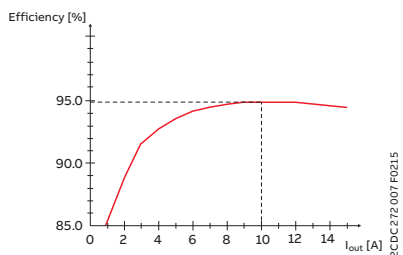


Typical power loss over AC input voltage

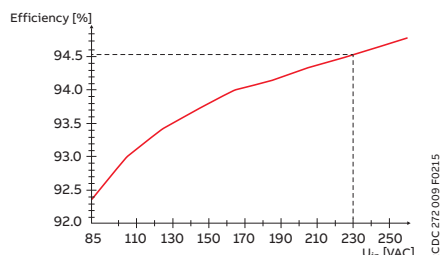


Typical power loss over output current

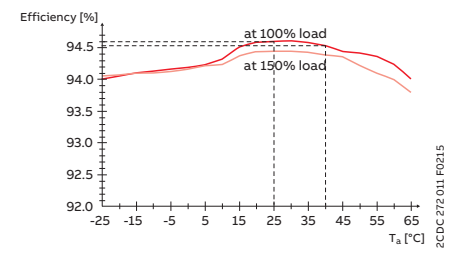
#### CP-C.1 24/10.0, CP-C.1 24/10.0 -L and CP-C.1 24/10.0-C



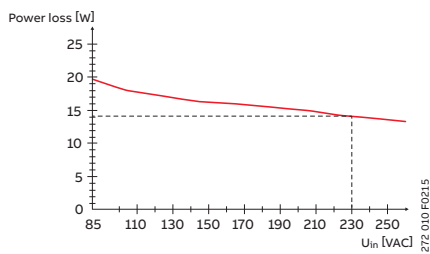
Typical efficiency over output current



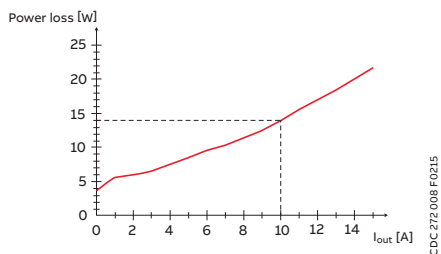
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



Typical power loss over AC input voltage

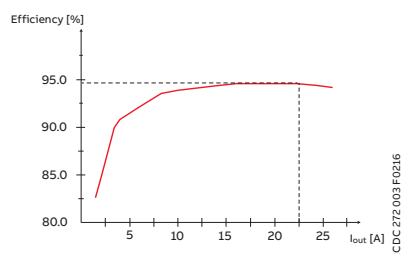


Typical power loss over output current

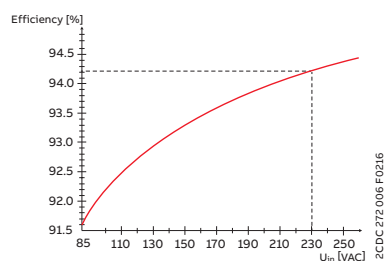
## CP-C.1 range

### Technical diagrams

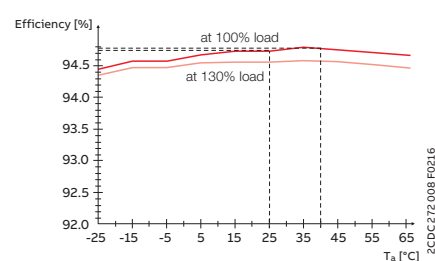
#### CP-C.1 24/20.0, CP-C.1 24/20.0-L and CP-C.1 24/20.0-C



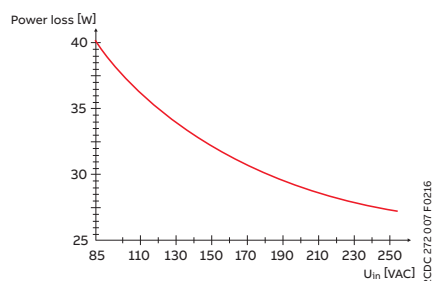
Typical efficiency over output current



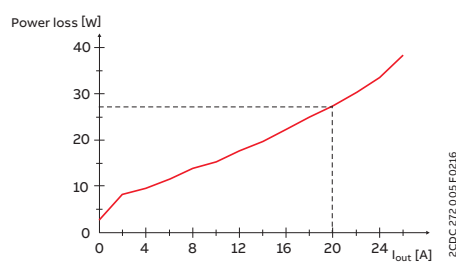
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



Typical power loss over AC input voltage

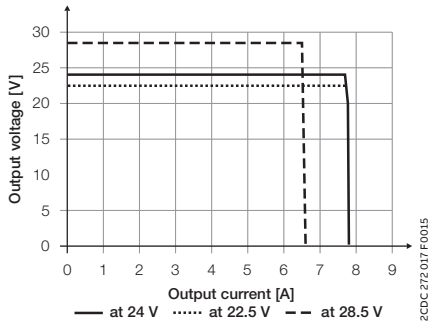


Typical power loss over output current

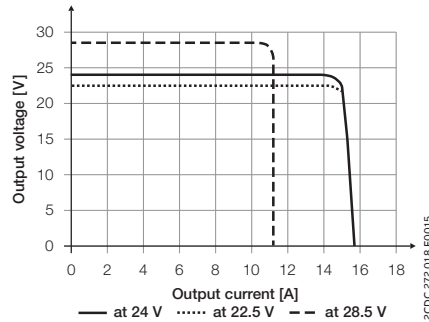
## CP-C.1 range

### Technical diagrams

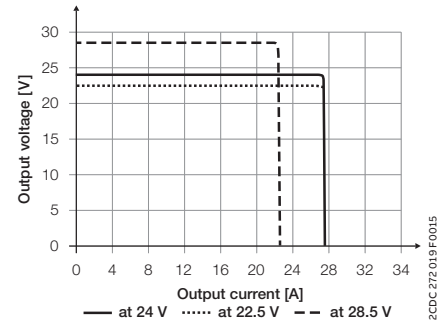
#### Characteristic curve of output at $T_a = 25^\circ\text{C}$



CP-C.1 24/5.0, CP-C.1 24/5.0-L  
CP-C.1 24/5.0-C

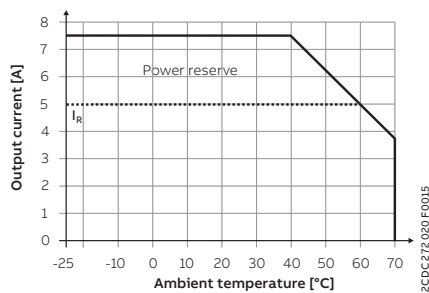


CP-C.1 24/10.0, CP-C.1 24/10.0-L  
CP-C.1 24/10.0-C

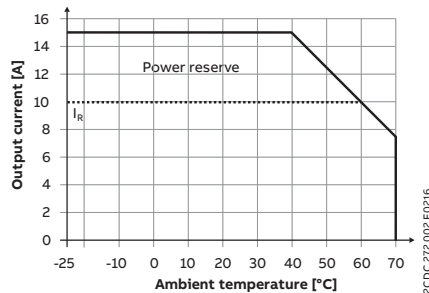


CP-C.1 24/20.0, CP-C.1 24/20.0-L  
CP-C.1 24/20.0-C

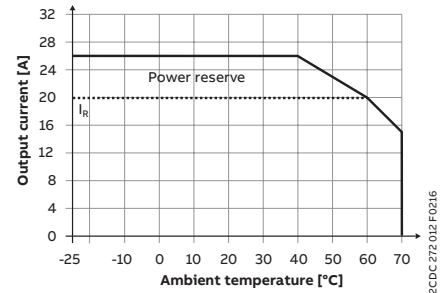
#### Characteristic curve of temperature at $U_{\text{out}} = 24\text{ V}$



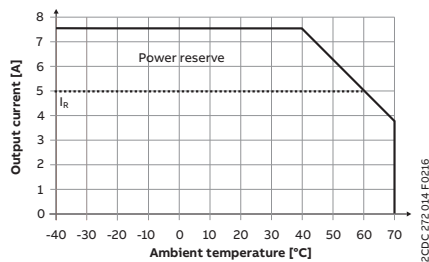
CP-C.1 24/5.0, CP-C.1 24/5.0-L



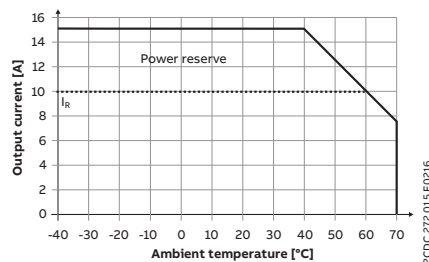
CP-C.1 24/10.0, CP-C.1 24/10.0-L



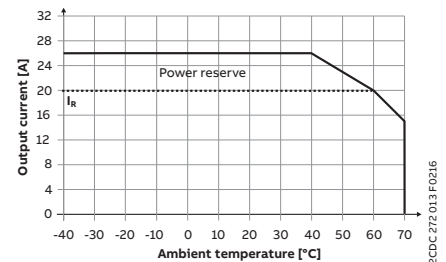
CP-C.1 24/20.0, CP-C.1 24/20.0-L



CP-C.1 24/5.0-C



CP-C.1 24/10.0-C



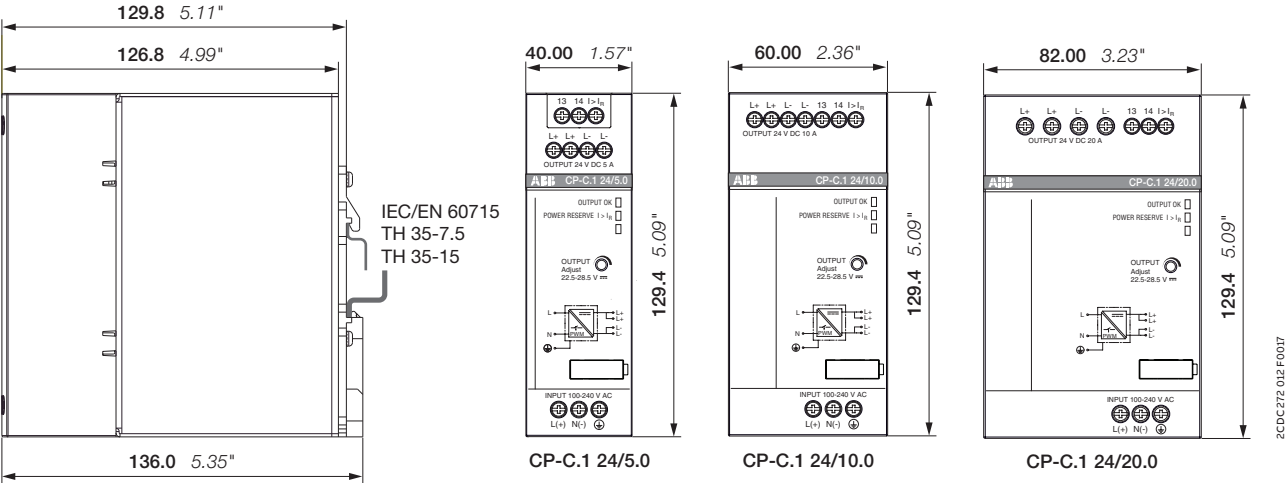
CP-C.1 24/20.0-C

CP-C.1 range

Technical diagrams

Dimensional drawings

Dimensions in mm, inches









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## **Power supplies for building applications**

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| <b>316</b> | <b>Operation controls</b>      |
| <b>317</b> | <b>Applications</b>            |
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## CP-D range

### Benefits and advantages



Thanks to its compact modular housing, the CP-D range is ideal for building applications and installation. For maximum flexibility in operation, six different versions are available, from 10 W up to 100 W. Their wide input voltage range allows their use in global applications.



#### Easy to install

The CP-D range is easy to adjust and ideally suited for installation in distribution panels due to its width being only 18 to 90 mm.



#### Global availability

The product can be used in any installation in the world. Giving you the confidence of worldwide sourcing – no matter where you build, install or operate your equipment.



#### Speed up your projects

Data available for common planning software: Less engineering time required.

## CP-D range

### Benefits and advantages



#### Characteristics

- Output voltages 12 V, 24 V DC
- Adjustable output voltages (devices > 10 W)
- Output currents 0.42 A / 0.83 A / 1.3 A / 2.1 A / 2.5 A / 4.2 A
- Power range 10 W, 25 W, 30 W, 60 W, 100 W
- Wide range input 100-240 V AC (90-264 V AC, 120-375 V DC)
- High efficiency of up to 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
- LEDs for status indication
- Light-grey housing in RAL 7035
- Various approvals and marks



#### Main benefits

##### Adjustable output voltage

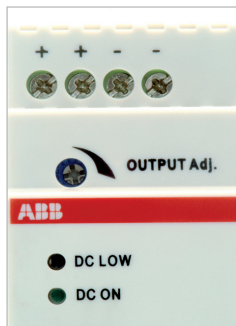
The CP-D range types > 10 W feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, for example compensating the voltage drop caused by a long line length.

##### Wide range input

Optimized for world-wide applications: The CP-D power supplies can be supplied with 90-264 V AC or 120-375 V DC.

##### Width and structural form

With their width being only 18 to 90 mm, the CP-D range switch mode power supplies are ideally suited for installation in distribution panels.



## CP-D range

### Operation controls

**OUTPUT ++/--:**  
terminals - output  
12 V, 24 V

**OUTPUT Adjust:**  
potentiometer -  
adjustment of output  
voltage<sup>1)</sup>

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

**Circuit diagram**

**INPUT L, N: terminals - input**  
90 ... 264 V AC  
120 ... 375 V DC



<sup>1)</sup> only for devices > 10 W. 12 V version: 12...14 V DC, 24 V version: 24 ... 28 V DC.



## CP-D range Applications



Emergency  
lighting



Communication



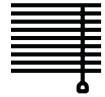
Escalators



Elevators



LED  
lighting



Venetian blind  
drives



## CP-D range

### Ordering details



CP-D 12/0.83, CP-D 24/0.42



CP-D 12/2.1, CP-D 24/1.3



CP-D 24/2.5

### Description

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 their high thermal efficiency, these power supplies have very low power and heat dissipation and can be operated without forced cooling. All power supply units in the CP-D range are approved according to all relevant international standards.

### Ordering details

| Input voltage range        | Rated output voltage / current | Type         | Order code      | Weight (1 pc.) kg (lb) |
|----------------------------|--------------------------------|--------------|-----------------|------------------------|
| 90-264 V AC / 120-375 V DC | 12 V DC / 0.83 A               | CP-D 12/0.83 | 1SVR427041R1000 | 0.06 (0.13)            |
| 90-264 V AC / 120-375 V DC | 12 V DC / 2.1 A                | CP-D 12/2.1  | 1SVR427043R1200 | 0.19 (0.41)            |
| 90-264 V AC / 120-375 V DC | 24 V DC / 0.42 A               | CP-D 24/0.42 | 1SVR427041R0000 | 0.06 (0.13)            |
| 90-264 V AC / 120-375 V DC | 24 V DC / 1.3 A                | CP-D 24/1.3  | 1SVR427043R0100 | 0.19 (0.41)            |
| 90-264 V AC / 120-375 V DC | 24 V DC / 2.5 A                | CP-D 24/2.5  | 1SVR427044R0200 | 0.25 (0.56)            |
| 90-264 V AC / 120-375 V DC | 24 V DC / 4.2 A                | CP-D 24/4.2  | 1SVR427045R0400 | 0.32 (0.71)            |



## CP-D range

### Technical data

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

| Type                                                                              | CP-D 12/0.83                                               | CP-D 12/2.1                                                                                                |                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------|
| <b>Input circuit - supply circuit</b>                                             |                                                            |                                                                                                            |                            |
| Rated input voltage U <sub>in</sub>                                               | 100-240 V AC                                               |                                                                                                            |                            |
| Input voltage range                                                               | 90-264 V AC / 120-375 V DC                                 |                                                                                                            |                            |
| Frequency range AC                                                                | 47-63 Hz                                                   |                                                                                                            |                            |
| Typical input current /<br>typical power consumption                              | at 115 V AC                                                | 200 mA / 12.68 W                                                                                           | 502 mA / 31.14 W           |
|                                                                                   | at 230 V AC                                                | 128.3 mA / 13.01 W                                                                                         | 277 mA / 31.2 W            |
| Inrush current                                                                    | at 115 / 230 V AC                                          | 16 A / 32 A                                                                                                | 25 A / 50 A                |
| Power failure buffering time                                                      | min. 30 ms                                                 |                                                                                                            |                            |
| Internal input fuse                                                               | 1 A slow-acting / 250 V AC                                 |                                                                                                            | 2 A slow-acting / 250 V AC |
| Power factor correction (PFC)                                                     | no                                                         |                                                                                                            |                            |
| <b>Indication of operational states</b>                                           |                                                            |                                                                                                            |                            |
| Output voltage                                                                    | DC ON: green LED                                           |  : output voltage applied |                            |
|                                                                                   | DC LOW: red LED                                            |  : output voltage too low |                            |
| <b>Output circuit</b>                                                             | <b>+ , -</b>                                               | <b>++ , --</b>                                                                                             |                            |
| Rated output voltage                                                              | 12 V DC                                                    |                                                                                                            |                            |
| Tolerance of the output voltage                                                   | ±1 %                                                       |                                                                                                            |                            |
| Adjustment range of the output voltage                                            | -                                                          |                                                                                                            | 12-14 V DC                 |
| Rated output power                                                                | 10 W                                                       |                                                                                                            | 25 W                       |
| Rated output current I <sub>r</sub>                                               | T <sub>a</sub> ≤ 60 °C                                     | 0.83 A                                                                                                     | 2.1 A                      |
| Derating of the output current                                                    | 60 °C < T <sub>a</sub> ≤ 70 °C                             | 2.5 %/°C                                                                                                   |                            |
| Maximum deviation with<br>change of output voltage within the input voltage range | load change statical                                       | max. 1 %                                                                                                   |                            |
|                                                                                   |                                                            | max. 1 %                                                                                                   |                            |
| Recover time T <sub>A</sub>                                                       | < 1 ms                                                     |                                                                                                            |                            |
| Starting time after applying the supply voltage                                   | at I <sub>r</sub>                                          | 1000 ms                                                                                                    |                            |
| Rise time                                                                         | at rated load                                              | typ. 1 ms                                                                                                  |                            |
| Residual ripple and switching peaks                                               | BW = 20 MHz                                                | 50 mV                                                                                                      |                            |
| Parallel connection                                                               | yes, using CP-D RU                                         |                                                                                                            |                            |
| Series connection                                                                 | yes, to increase voltage                                   |                                                                                                            |                            |
| Resistance to reverse feed                                                        | 18 V / 1 s                                                 |                                                                                                            |                            |
| <b>Output circuit - No-load, overload and short-circuit behavior</b>              |                                                            |                                                                                                            |                            |
| Characteristic curve of output                                                    | hiccup-mode                                                |                                                                                                            | U/I characteristic curve   |
| Short-circuit protection                                                          | continuous short-circuit stability                         |                                                                                                            |                            |
| Short-circuit behavior                                                            | continuation with output power limiting                    |                                                                                                            |                            |
| Current limiting at short circuit                                                 | typ. 1.4 A                                                 |                                                                                                            | typ. 5.9 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                                                  |                                                                                                            |                            |
| <b>General data</b>                                                               |                                                            |                                                                                                            |                            |
| Efficiency                                                                        | typ. 78 %                                                  |                                                                                                            | typ. 82 %                  |
| Duty cycle                                                                        | 100 %                                                      |                                                                                                            |                            |
| Dimensions                                                                        | see “Dimensional drawings”                                 |                                                                                                            |                            |
| Material of housing                                                               | plastic                                                    |                                                                                                            |                            |
| 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                                                                  | II                                                         |                                                                                                            |                            |

## CP-D range

### Technical data

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

| Type                                                      |                                   | CP-D 12/0.83                  | CP-D 12/2.1             |
|-----------------------------------------------------------|-----------------------------------|-------------------------------|-------------------------|
| Electrical connection - Input circuit / Output circuit    |                                   |                               |                         |
| Connecting capacity                                       | fine-strand with wire end ferrule | 0.2-1.5 mm² (24-16 AWG)       | 0.2-2.5 mm² (24-14 AWG) |
|                                                           | rigid                             | 0.2-2.5 mm² (26-12 AWG)       | 0.2-2.5 mm² (24-12 AWG) |
| Stripping length                                          |                                   | 4-5 mm (0.16-0.2 in)          | 7 mm (0.28 in)          |
| Tightening torque                                         |                                   | 0.6 Nm (5 lb.in)              | 0.7 Nm (6 lb.in)        |
| Environmental data                                        |                                   |                               |                         |
| Ambient temperature range                                 | operation                         | -40...+70 °C (-40...+158 °F)  |                         |
|                                                           | rated load                        | -40...+60 °C (-40...+131 °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 cycles, 40 °C, 95 % RH |                         |
| Vibration (sinusoidal) (IEC/EN 60068-2-6)                 |                                   | 50 m/s², 10 Hz - 2 kHz        |                         |
| Shock (half-sine) (IEC/EN 60068-2-27)                     |                                   | 40 m/s², 22 ms                |                         |
| Isolation data                                            |                                   |                               |                         |
| Rated insulation voltage U <sub>i</sub>                   | 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                    |                         |
| EMC Directive                                             |                                   | 2014/30/EU                    |                         |
| RoHS Directive                                            |                                   | 2011/65/EU                    |                         |
| Protective low voltage                                    |                                   | SELV (IEC/EN 60950-1)         |                         |
| Electromagnetic compatibility                             |                                   |                               |                         |
| Interference immunity to                                  |                                   | IEC/EN 61000-6-2              |                         |
| electrostatic discharge                                   | IEC/EN 61000-4-2                  | level 4 (4 kV / 8 kV)         | level 4 (4 kV / 15 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                                   |                                   | class B                       |                         |
| high-frequency conducted                                  |                                   | class B                       |                         |

## CP-D range

### Technical data

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

| Type                                                                                                      |                   | CP-D 24/0.42                                               | CP-D 24/1.3                                 | CP-D 24/2.5                                 | CP-D 24/4.2                                 |
|-----------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------|---------------------------------------------|---------------------------------------------|---------------------------------------------|
| Input circuit - supply circuit                                                                            |                   | L, N                                                       |                                             |                                             |                                             |
| Rated input voltage U <sub>in</sub>                                                                       |                   | 100-240 V AC                                               |                                             |                                             |                                             |
| Input voltage range                                                                                       |                   | 90-264 V AC /120-375 V DC                                  |                                             |                                             |                                             |
| Frequency range AC                                                                                        |                   | 47-63 Hz                                                   |                                             |                                             |                                             |
| Typical input current /<br>typical power consumption                                                      | at 115 V AC       | 184 mA / 11.62 W                                           | 600 mA / 37.92 W                            | 1120 mA / 69.3 W                            | 1800 mA / 117.3 W                           |
|                                                                                                           | at 230 V AC       | 120.6 mA / 12 W                                            | 344 mA / 38.16 W                            | 660 mA / 70.1 W                             | 900 mA / 114.4 W                            |
| Inrush current                                                                                            | at 115 / 230 V AC | max. 16 A / 32 A                                           | max. 25 A / 50 A                            | max. 30 A / 60 A                            |                                             |
| Power failure buffering time                                                                              |                   | min. 30 ms                                                 |                                             | min. 60 ms                                  |                                             |
| Internal input fuse                                                                                       |                   | 1 A slow-acting /<br>250 V AC                              | 2 A slow-acting /<br>250 V AC               |                                             | 3.15 A slow-<br>acting / 250 V AC           |
| Power factor correction (PFC)                                                                             |                   | no                                                         |                                             |                                             |                                             |
| Indication of operational states                                                                          |                   |                                                            |                                             |                                             |                                             |
| Output voltage                                                                                            | DC ON: green LED  | <input type="checkbox"/> : output voltage applied          |                                             |                                             |                                             |
|                                                                                                           | DC LOW: red LED   | <input type="checkbox"/> : output voltage too low          |                                             |                                             |                                             |
| Output circuit                                                                                            |                   | +, -                                                       |                                             | ++, --                                      |                                             |
| Rated output voltage                                                                                      |                   | 24 V DC                                                    |                                             |                                             |                                             |
| Tolerance of the output voltage                                                                           |                   | ±1 %                                                       |                                             |                                             |                                             |
| Adjustment range of the output voltage                                                                    |                   | -                                                          | 24-28 V DC                                  |                                             |                                             |
| Rated output power                                                                                        |                   | 10 W                                                       | 30 W                                        | 60 W                                        | 100 W                                       |
| Rated output current I <sub>r</sub>                                                                       |                   | T <sub>a</sub> ≤ 60 °C: 0.42 A                             | T <sub>a</sub> ≤ 60 °C: 1.3 A               | T <sub>a</sub> ≤ 55 °C: 2.5 A               | T <sub>a</sub> ≤ 60 °C: 4.2 A               |
| Derating of the output current                                                                            |                   | 60 °C < T <sub>a</sub> ≤ 70 °C:<br>2.5 %/°C                | 60 °C < T <sub>a</sub> ≤ 70 °C:<br>2.5 %/°C | 55 °C < T <sub>a</sub> ≤ 70 °C:<br>2.5 %/°C | 60 °C < T <sub>a</sub> ≤ 70 °C:<br>2.5 %/°C |
| Maximum deviation with<br>load change statical<br>change of output voltage within the input voltage range |                   | max. 1 %                                                   |                                             |                                             |                                             |
|                                                                                                           |                   | max. 1 %                                                   |                                             |                                             |                                             |
| Recover time T <sub>A</sub>                                                                               |                   | < 1 ms                                                     |                                             |                                             |                                             |
| Starting time after applying the supply voltage                                                           |                   | at I <sub>r</sub>                                          | 1000 ms                                     |                                             |                                             |
| Rise time                                                                                                 |                   | at rated load                                              | typ. 1 ms                                   |                                             |                                             |
| Residual ripple and switching peaks                                                                       |                   | BW = 20 MHz                                                | 50 mV                                       |                                             |                                             |
| Parallel connection                                                                                       |                   | yes, using CP-D RU                                         |                                             |                                             |                                             |
| Series connection                                                                                         |                   | yes, to increase voltage                                   |                                             |                                             |                                             |
| Resistance to reverse feed                                                                                |                   | 35 V / 1 s                                                 |                                             |                                             |                                             |
| Output circuit - No-load, overload and short-circuit behavior                                             |                   |                                                            |                                             |                                             |                                             |
| Characteristic curve of output                                                                            |                   | hiccup-mode                                                | U/I characteristic curve                    |                                             |                                             |
| Short-circuit protection                                                                                  |                   | continuous short-circuit stability                         |                                             |                                             |                                             |
| Short-circuit behavior                                                                                    |                   | continuation with output power limiting                    |                                             |                                             |                                             |
| Current limiting at short circuit                                                                         |                   | typ. 0.78 A                                                | typ. 4.2 A                                  | typ. 6.05 A                                 | 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                                                                                              |                   |                                                            |                                             |                                             |                                             |
| Efficiency                                                                                                |                   | typ. 80 %                                                  | typ. 83 %                                   | typ. 86 %                                   | typ. 89 %                                   |
| Duty cycle                                                                                                |                   | 100 %                                                      |                                             |                                             |                                             |
| Dimensions                                                                                                |                   | see “Dimensional drawings”                                 |                                             |                                             |                                             |
| Material of housing                                                                                       |                   | plastic                                                    |                                             |                                             |                                             |
| 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                                                                                          |                   | II                                                         |                                             |                                             |                                             |

## CP-D range

### Technical data

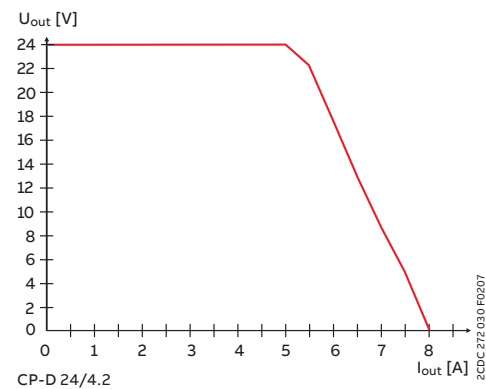
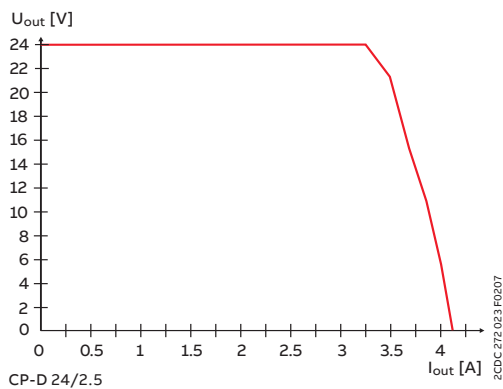
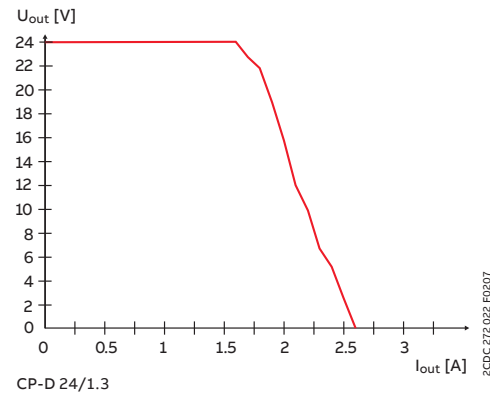
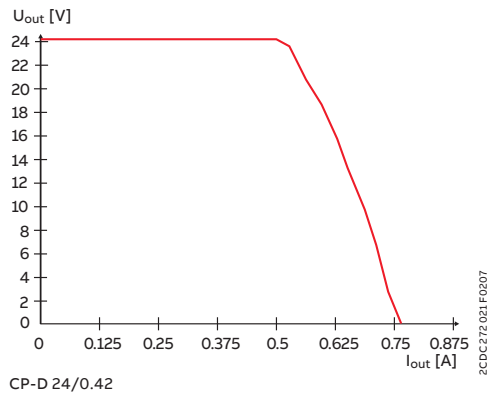
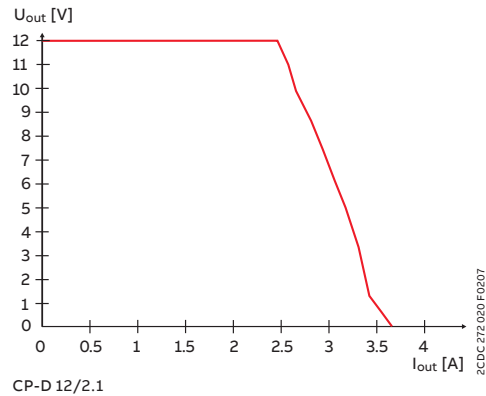
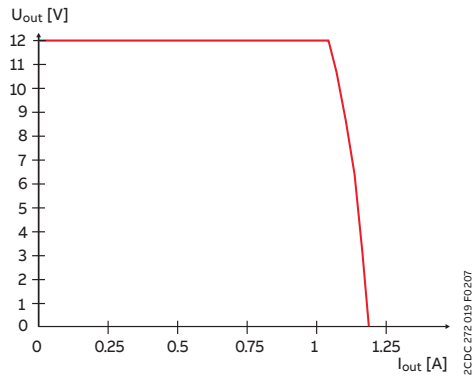
Data at  $T_a = 25\text{ °C}$ ,  $U_{in} = 230\text{ V AC}$  and rated values, unless otherwise indicated

| Type                                                      |                                   | CP-D 24/0.42                  | CP-D 24/1.3             | CP-D 24/2.5      | CP-D 24/4.2           |
|-----------------------------------------------------------|-----------------------------------|-------------------------------|-------------------------|------------------|-----------------------|
| Electrical connection - Input circuit / Output circuit    |                                   |                               |                         |                  |                       |
| Connecting capacity                                       | fine-strand with wire end ferrule | 0.2-1.5 mm² (24-16 AWG)       | 0.2-2.5 mm² (24-14 AWG) |                  |                       |
|                                                           | rigid                             | 0.2-2.5 mm² (26-12 AWG)       | 0.2-2.5 mm² (24-12 AWG) |                  |                       |
| Stripping length                                          |                                   | 4-5 mm (0.16-0.2 in)          |                         | 7 mm (0.28 in)   |                       |
| Tightening torque                                         |                                   | 0.6 Nm (5 lb.in)              |                         | 0.7 Nm (6 lb.in) |                       |
| Environmental data                                        |                                   |                               |                         |                  |                       |
| Ambient temperature range                                 | operation                         | -40...+70 °C                  |                         |                  |                       |
|                                                           | rated load                        | -40...+60 °C                  |                         | -40...+55 °C     | -40...+60 °C          |
|                                                           | storage                           | -40...+85 °C                  |                         |                  |                       |
| Altitude during operation                                 | IEC/EN 60068-2-13                 | max. 4850 m                   |                         |                  |                       |
| Damp heat (cyclic) (IEC/EN 60068-2-30)                    |                                   | 4 x 24 cycles, 40 °C, 95 % RH |                         |                  |                       |
| Vibration (sinusoidal) (IEC/EN 60068-2-6)                 |                                   | 50 m/s², 10 Hz - 2 kHz        |                         |                  |                       |
| Shock (half-sine) (IEC/EN 60068-2-27)                     |                                   | 40 m/s², 22 ms                |                         |                  |                       |
| Isolation data                                            |                                   |                               |                         |                  |                       |
| Rated insulation voltage U <sub>i</sub>                   | input circuit / output circuit    | 3 kV AC                       |                         | 4 kV AC          | 3 kV AC               |
| Pollution degree                                          |                                   | 2                             |                         |                  |                       |
| Overvoltage category                                      |                                   | II                            |                         |                  |                       |
| Standards / Directives                                    |                                   |                               |                         |                  |                       |
| Standards                                                 |                                   | IEC/EN 60950-1                |                         |                  |                       |
| Low Voltage Directive                                     |                                   | 2014/35/EU                    |                         |                  |                       |
| EMC Directive                                             |                                   | 2014/30/EU                    |                         |                  |                       |
| RoHS Directive                                            |                                   | 2011/65/EU                    |                         |                  |                       |
| Protective low voltage                                    |                                   | SELV (IEC/EN 60950-1)         |                         |                  |                       |
| Electromagnetic compatibility                             |                                   |                               |                         |                  |                       |
| Interference immunity to                                  |                                   | IEC/EN 61000-6-2              |                         |                  |                       |
| electrostatic discharge                                   | IEC/EN 61000-4-2                  | level 4 (4 kV / 8 kV)         | level 4 (4 kV / 15 kV)  |                  | 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                                   |                                   | class B                       |                         |                  |                       |
| high-frequency conducted                                  |                                   | class B                       |                         |                  |                       |

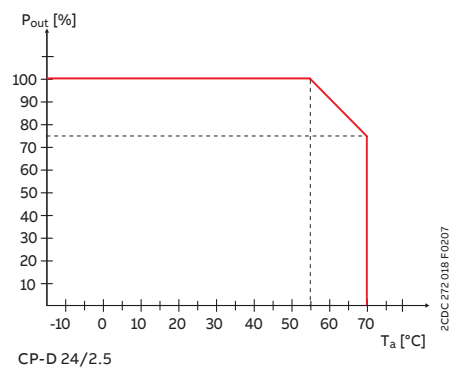
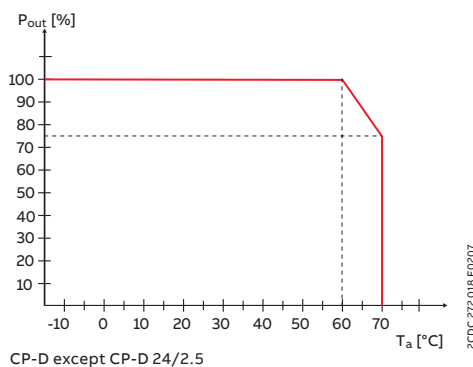
## CP-D range

### Technical diagrams

#### Characteristic curve of output at $T_a = 25^\circ\text{C}$



#### Characteristic curve of temperature at rated output voltage

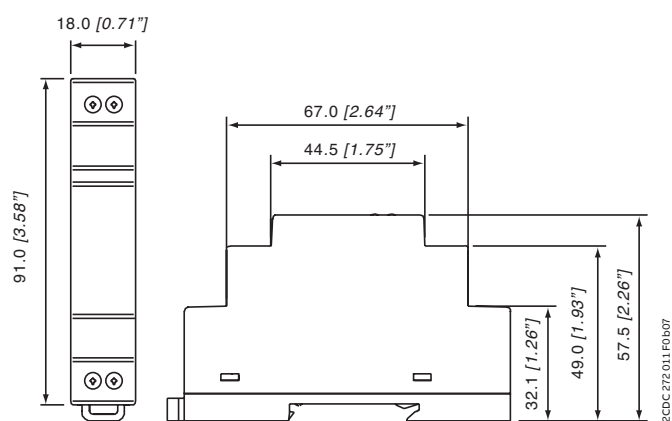


## CP-D range

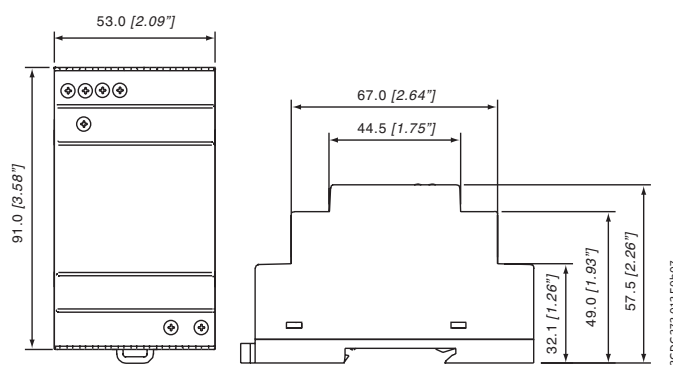
### Technical diagrams

#### Dimensional drawings

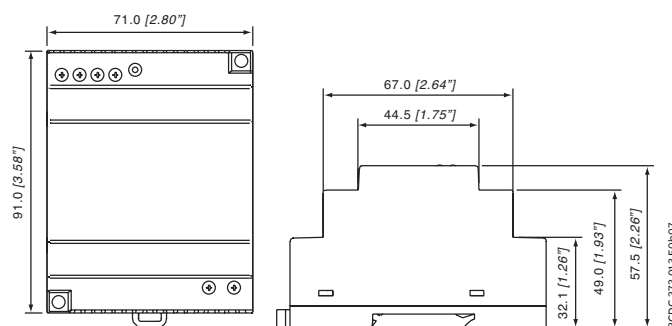
Dimensions in mm



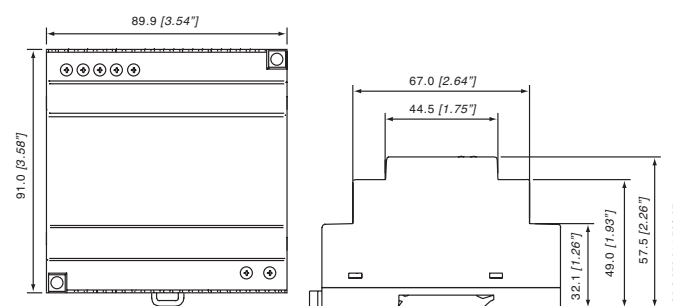
CP-D 12/0.83, CP-D 24/0.42



CP-D 12/2.1, CP-D 24/1.3



CP-D 24/2.5



CP-D 24/4.2







---

## **CP-B range**

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## CP-B range

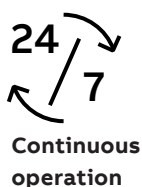
### Benefits and advantages



ABB's ultra-capacitor based CP-B buffer modules serve to ensure a short-term uninterrupted power supply system with a voltage of 24 V DC by buffering the load in case of power loss.

The buffer modules feature a technology for storing energy: the use of ultra-capacitors obviates the need for maintenance and exempts deep discharge in comparison to batteries.

Energy storage can be expanded with additional extension modules for longer buffering times and is therefore extremely adaptable.



- Buffering 24 V DC supply of up to 380 s
- Maintenance-free, ultra-capacitor technology
- Temperature resistant
- No deep charge
- Small footprint

## CP-B range

### Benefits and advantages

Power supply systems have to be highly reliable in most areas of energy management and automation technology. Often, batteries are used for supporting the supply system in case of mains failures. Batteries have limited lifetimes depending on environmental parameters and have to be maintained regularly, which causes extra work and costs.

Using the ultra-capacitor technology, ABB offers an innovative and completely maintenance-free new product for buffering the 24 V DC supply in case of interrupted mains on the primary side of the switch mode power supply.

The CP-B range is an ultra-capacitor buffer energy storage system for power supply units which ensures a short term uninterrupted power supply system. In case of power loss, the energy stored in the capacitor guarantees that the load is continually provided for up to several hundred seconds depending on the load current.



#### Characteristics

- 3 buffer modules for buffering 24 V DC:  
CP-B 24/3.0 (3 A / 1 kWs<sup>1)</sup>)  
CP-B 24/10.0 (10 A / 10 kWs<sup>1)</sup>)  
CP-B 24/20.0 (20 A / 8 kWs<sup>1)</sup>)
- CP-B 24/3.0 and CP-B 24/20.0 expandable with additional extension module(s)  
CP-B EXT.2 (2 kWs<sup>1)</sup>)
- LEDs for status indication
- Relay contacts for status messaging
- Very high backup times (e.g. with CP-B 24/10.0 up to 8 minutes at 1 A load current)
- Short charging times
- High efficiency, higher than 90 %
- Wide temperature range
- DIN rail mountable, compact housing
- Extended temperature range -40...60 °C

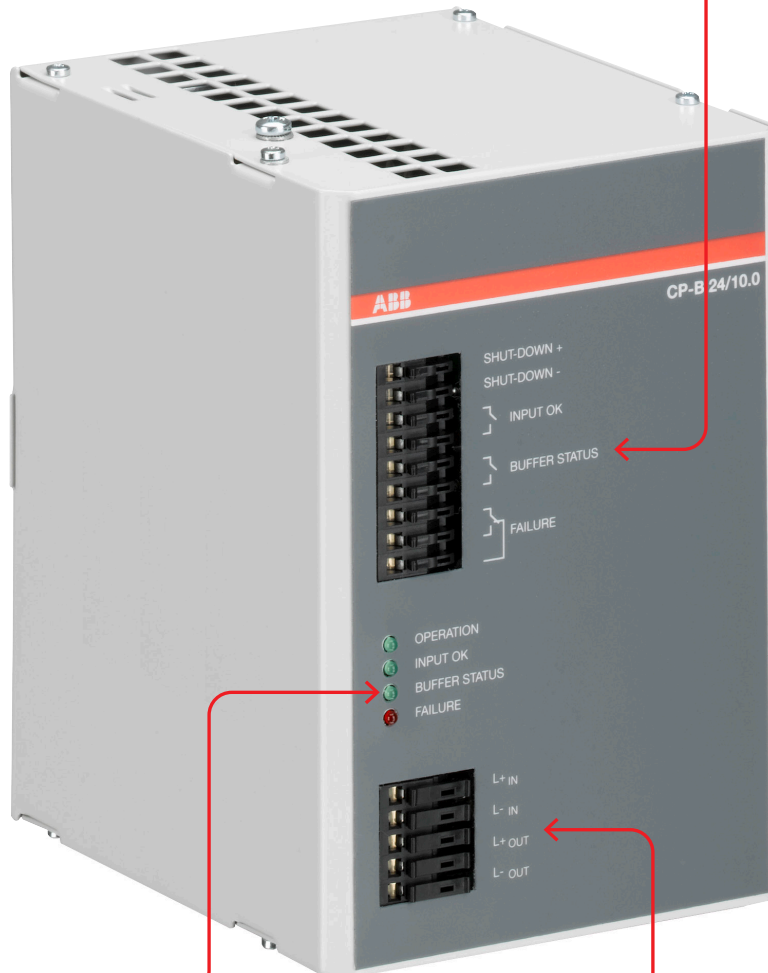
<sup>1)</sup> internal energy buffer

|                                                      |       | CP-B 24/3.0     | CP-B 24/10.0    | CP-B 24/20.0    | CP-B EXT.2      |
|------------------------------------------------------|-------|-----------------|-----------------|-----------------|-----------------|
| Order code                                           |       | 1SVR427060R0300 | 1SVR427060R1000 | 1SVR427060R2000 | 1SVR427065R0000 |
| Rated input voltage                                  |       | 24 V DC         | 24 V DC         | 24 V DC         | –               |
| Rated current                                        |       | 3 A DC          | 10 A DC         | 20 A DC         | 3 A DC          |
| Energy storage (min.)                                |       | 1.000 Ws        | 10.000 Ws       | 8.000 Ws        | 2.000 Ws        |
| Typical charging time at load current                | 100 % | 65 s            | 134 s           | 135 s           |                 |
|                                                      | 0 %   | 56 s            | 82 s            | 62 s            |                 |
| Typical buffering time <sup>1)</sup> at load current | 100 % | 13 s            | 38 s            | 15 s            |                 |
|                                                      | 50 %  | 28 s            | 76 s            | 30 s            |                 |
|                                                      | 25 %  | 66 s            | 140 s           | 60 s            |                 |
|                                                      | 10 %  | 148 s           | 380 s           | 150 s           |                 |

<sup>1)</sup> buffering time  $\approx \frac{\text{energy storage} \times 0.9}{\text{current} \times \text{output voltage}}$

## CP-B range

### Operation controls



#### Input terminals

SHUT-DOWN+,  
SHUT-DOWN-:  
Input signal terminals  
INPUT OK,  
BUFFER STATUS,  
FAILURE:  
Signalling contact –  
terminals  
L<sub>+</sub> IN, L<sub>-</sub> IN: Input voltage  
terminals

#### Indication of operational states

OPERATION:  
Buffer module in operation  
(standby or buffering)  
INPUT OK:  
Input voltage applied

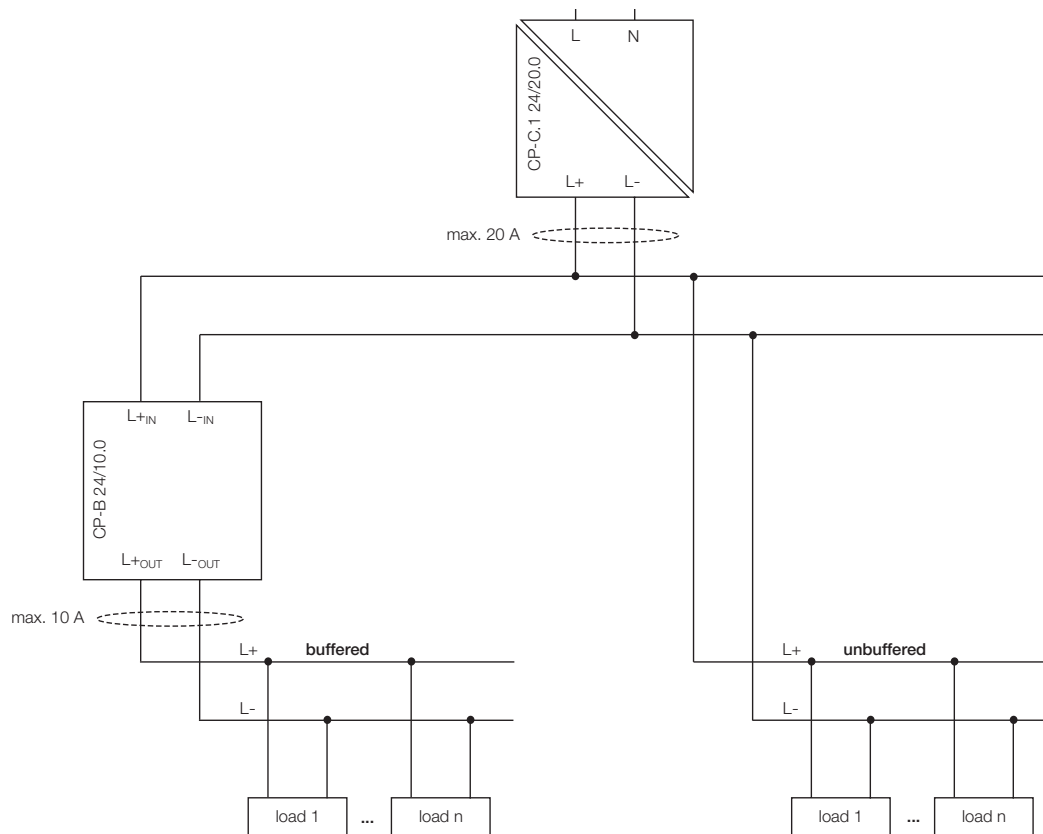
#### Output terminals

L<sub>+</sub> OUT, L<sub>-</sub> OUT, L<sub>-</sub> OUT:  
Output voltage  
terminals



# CP-B range Applications

## Example of application



CP-B range

Ordering details



CP-B 24/3.0

2CDC271 001 S0010



CP-B 24/10.0

2CDC271 002 S0010



CP-B 24/20.0

2CDC271 003 S0010

Description

Ultra capacitor based buffer units of the CP-B range offer the highest reliability also in harsh environments. Thanks to their ultra-cap based technology, the units are maintenance free, there will be no deep discharge and these products offer a very wide operational ambient temperature range. CP-B range buffer units are an excellent solution for avoiding voltage drops in solar applications, for example.

Ordering details

| Rated input voltage | Rated current | Type         | Order code      | Weight<br>(1 pc.)<br>kg (lb) |
|---------------------|---------------|--------------|-----------------|------------------------------|
| 24 V DC             | 3 A DC        | CP-B 24/3.0  | 1SVR427060R0300 | 0.59 (1.31)                  |
|                     | 10 A DC       | CP-B 24/10.0 | 1SVR427060R1000 | 2.10 (4.63)                  |
|                     | 20 A DC       | CP-B 24/20.0 | 1SVR427060R2000 | 2.20 (4.85)                  |

Ordering details - Extension unit for CP-B 24/3.0 and CP-B 24/20.0

| Rated voltage | Voltage range | Type       | Order code      | Weight<br>(1 pc.)<br>kg (lb) |
|---------------|---------------|------------|-----------------|------------------------------|
| 24 V DC       | 0-26.4 V DC   | CP-B EXT.2 | 1SVR427065R0000 | 1.04 (2.30)                  |

## CP-B range

### Technical data

| Type                                                       |                        | CP-B 24/3.0                                                                                | CP-B 24/10.0                                        | CP-B 24/20.0                            |
|------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------|
| <b>Input circuit - Supply circuit</b>                      |                        | <b>L<sup>+</sup><sub>IN</sub> L<sup>-</sup><sub>IN</sub></b>                               |                                                     |                                         |
| Rated input voltage U <sub>in</sub>                        |                        | 24 V DC                                                                                    |                                                     |                                         |
| Input voltage range                                        |                        | 23.7-26.4 V DC                                                                             | 23.9-27 V DC                                        | 23.4-29 V DC                            |
| Minimum charging potential                                 |                        | 23.7 V DC                                                                                  | 23.9 V DC                                           | 23.4 V DC                               |
| Rated input current                                        |                        | 3 A DC                                                                                     | 10 A DC                                             | 20 A DC                                 |
| Inrush current limiting                                    |                        | 50 A / 1 ms                                                                                | 35 A / 2 ms                                         | 35 A / 2 ms                             |
| Transient overvoltage protection                           |                        | suppressor diode                                                                           | varistor / suppressor diode                         | varistor / suppressor diode             |
| Internal input fuse (apparatus protection, not accessible) |                        | 4 A slow acting                                                                            | 15 A (FK2)                                          | 30 A (FK2)                              |
| Internal fuse capacitors circuit (not accessible)          |                        |                                                                                            | 25 A (FK2)                                          |                                         |
| Kind of input                                              | SHUT-DOWN              | -                                                                                          | control input                                       | control input                           |
|                                                            | rated voltage          | -                                                                                          | 24 V DC                                             | 24 V DC                                 |
|                                                            | voltage range          | -                                                                                          | 6-45 V DC                                           | 6-45 V DC                               |
| <b>Output circuit</b>                                      |                        | <b>L<sup>+</sup><sub>OUT</sub> L<sup>-</sup><sub>OUT</sub> L<sup>-</sup><sub>OUT</sub></b> |                                                     |                                         |
| Rated output power                                         |                        | 69 W                                                                                       | 240 W                                               | 480 W                                   |
| Rated output voltage U <sub>out</sub>                      |                        | 24 V DC                                                                                    |                                                     |                                         |
| Output voltage (buffer mode)                               |                        | 23.0 V DC                                                                                  | 23.2 V DC                                           | 23.2 V DC                               |
| Tolerance of the output voltage                            |                        | +2...-10 %                                                                                 |                                                     |                                         |
| Rated output current I <sub>r</sub>                        | T <sub>a</sub> ≤ 60 °C | 3 A DC                                                                                     | 10 A DC                                             | 20 A DC                                 |
| Peak output current (fully loaded capacitors required)     | T <sub>a</sub> ≤ 60 °C | 6 A DC (min. 1.5 s)                                                                        | 20 A DC (10 A power supply + 10 A CP-B, min. 1.5 s) | 40 A DC (min. 1.5 s)                    |
| Control of limiting current                                |                        | -                                                                                          | 10.3 A DC ±0.1A                                     | -                                       |
| Shut-down if limiting current is exceeded                  |                        | -                                                                                          | after 1.5 s                                         | -                                       |
| Short-circuit protection (only via external fuse)          |                        | no continuous short-circuit stability                                                      |                                                     |                                         |
| Internal output fuse (not accessible)                      |                        | -                                                                                          | 15 A (FK2)                                          | -                                       |
| Required external fuse                                     |                        | 3.15 A slow acting                                                                         | 10 A slow acting                                    | 25 A slow acting                        |
| Current limiting at output circuit                         |                        | -                                                                                          | 1.05...1.2 × I <sub>r</sub>                         | -                                       |
| Breaking capacity of output circuit                        | t = 2.5 ms             | -                                                                                          | 24 V DC, 10 A                                       | -                                       |
| Power failure buffering time <sup>1)</sup>                 |                        | load-dependent, min. 13 s at 100 % load                                                    | load-dependent, min. 38 s at 100 % load             | load-dependent, min. 15 s at 100 % load |
| Overload protection                                        |                        | thermal protection                                                                         |                                                     |                                         |
| Kind of output                                             | INPUT OK               | n/o contact                                                                                |                                                     |                                         |
|                                                            | BUFFER STATUS          | -                                                                                          | n/o contact                                         |                                         |
|                                                            | FAILURE                | -                                                                                          | c/o contact                                         |                                         |
| Contact material                                           |                        | Ag + Au-clad                                                                               |                                                     |                                         |
| Minimum switching voltage / Minimum switching current      |                        | 5 V DC / 1 mA                                                                              |                                                     |                                         |
| Maximum switching voltage / Maximum switching current      |                        | 50 V AC / 1.0 A, 30 V DC / 0.5 A                                                           |                                                     |                                         |
| Mechanical lifetime                                        |                        | 5 × 10 <sup>6</sup> switching cycles                                                       |                                                     |                                         |
| Electrical lifetime                                        |                        | 0.1 × 10 <sup>6</sup> switching cycles                                                     |                                                     |                                         |
| Maximum fuse rating to achieve short-circuit protection    | n/o or n/c contact     | 1.0 A AC / 0.5 A DC                                                                        |                                                     |                                         |

## CP-B range

### Technical data

| Type                                                      |                                        | CP-B 24/3.0                                                    | CP-B 24/10.0                            | CP-B 24/20.0                            |
|-----------------------------------------------------------|----------------------------------------|----------------------------------------------------------------|-----------------------------------------|-----------------------------------------|
| General data                                              |                                        |                                                                |                                         |                                         |
| Maximum internal power consumption                        |                                        | 7 W                                                            | 20 W                                    | 40 W                                    |
| Power consumption with unloaded output                    |                                        | 0.75 W                                                         | 3 W                                     | 1.6 W                                   |
| Energy storage (min.)                                     |                                        | 1000 Ws                                                        | 10000 Ws                                | 8000 Ws                                 |
| Typical charging time at load current                     | 100 %                                  | 65 s                                                           | 134 s                                   | 135 s                                   |
|                                                           | 0 %                                    | 56 s                                                           | 82 s                                    | 62 s                                    |
| Typical buffering time at load current <sup>1)</sup>      | 100 %                                  | 13 s                                                           | 38 s                                    | 15 s                                    |
|                                                           | 50 %                                   | 28 s                                                           | 76 s                                    | 30 s                                    |
|                                                           | 25 %                                   | 66 s                                                           | 140 s                                   | 60 s                                    |
|                                                           | 10 %                                   | 148 s                                                          | 380 s                                   | 150 s                                   |
| Efficiency                                                |                                        | > 90 %                                                         |                                         |                                         |
| Dimensions                                                |                                        | see “Dimensional drawings”                                     |                                         |                                         |
| Material                                                  | cover / housing shell                  | steel sheet powdered                                           |                                         |                                         |
| Mounting                                                  |                                        | DIN rail (IEC/EN 60715), snap-on mounting                      |                                         |                                         |
| Mounting position                                         |                                        | horizontal                                                     |                                         |                                         |
| Minimum distance to other units                           | horizontal                             | not necessary                                                  |                                         |                                         |
|                                                           | vertical                               | 40 mm (1.58 in)                                                |                                         | 80 mm (3.15 in)                         |
| Pollution degree                                          |                                        | 2                                                              |                                         |                                         |
| Degree of protection                                      | housing / terminal                     | IP20                                                           |                                         |                                         |
| Protection class (IEC/EN 61140)                           |                                        | III SELV / PELV (condition: power supply fulfills class III)   |                                         |                                         |
| Electrical connection - Input circuit / Output circuit    |                                        | pull spring terminals                                          | pull spring terminals                   | pluggable screw type terminals          |
| Connecting capacity                                       | fine-strand with(out) wire end ferrule | 0.08-1.0 mm <sup>2</sup><br>(28-18 AWG)                        | 0.08-1.5 mm <sup>2</sup><br>(28-18 AWG) | 0.2-4.0 mm <sup>2</sup><br>(24-12 AWG)  |
|                                                           | rigid                                  | 0.08-1.5 mm <sup>2</sup><br>(28-16 AWG)                        | 0.08-4.0 mm <sup>2</sup><br>(28-16 AWG) | 0.2-6.0 mm <sup>2</sup><br>(24-10 AWG)  |
| Stripping length                                          |                                        | 6.0 mm (0.24 in)                                               |                                         | 7.0 mm (0.28 in)                        |
| Signaling circuit                                         |                                        |                                                                |                                         |                                         |
| Connecting capacity                                       | fine-strand with(out) wire end ferrule | 0.08-1.0 mm <sup>2</sup> (28-18 AWG)                           |                                         | 0.14-1.0 mm <sup>2</sup><br>(26-16 AWG) |
|                                                           | rigid                                  | 0.08-1.5 mm <sup>2</sup> (28-16 AWG)                           |                                         | 0.14-1.5 mm <sup>2</sup><br>(28-16 AWG) |
| Stripping length                                          |                                        | 6.0 mm (0.24 in)                                               |                                         | 7.0 mm (0.28 in)                        |
| Environmental data                                        |                                        |                                                                |                                         |                                         |
| Ambient temperature                                       | operation                              | -40...+60 °C                                                   |                                         |                                         |
|                                                           | storage                                | -40...+60 °C                                                   |                                         |                                         |
| Standards / Directives                                    |                                        |                                                                |                                         |                                         |
| Standards                                                 |                                        | EN 50178, IEC/EN 60950-1, IEC/EN 62040-2                       |                                         |                                         |
| Low Voltage Directive                                     |                                        | 2014/35/EU                                                     |                                         |                                         |
| EMC Directive                                             |                                        | 2014/30/EU                                                     |                                         |                                         |
| RoHS Directive                                            |                                        | 2011/65/EC                                                     |                                         |                                         |
| Electromagnetic compatibility                             |                                        |                                                                |                                         |                                         |
| Interference immunity to                                  |                                        | IEC/EN 61000-6-2                                               |                                         |                                         |
| electrostatic discharge                                   | IEC/EN 61000-4-2                       | level 3, 6 kV / 8 kV                                           |                                         |                                         |
| radiated, radio-frequency, electromagnetic field          | IEC/EN 61000-4-3                       | level 3, 10 V/m (27-1000 MHz) / level 2, 3 V/m (1400-2700 MHz) |                                         |                                         |
| electrical fast transient/burst                           | IEC/EN 61000-4-4                       | level 3, 2(1) kV / 5 kHz                                       |                                         |                                         |
| surge                                                     | IEC/EN 61000-4-5                       | level 1, 0.5 kV                                                |                                         |                                         |
| conducted disturbances, induced by radio-frequency fields | IEC/EN 61000-4-6                       | level 3, 10 V (150 kHz-80 MHz)                                 |                                         |                                         |
| voltage dips, short interruptions and voltage variations  | IEC/EN 61000-4-11                      | buffered by ultra-capacitors                                   |                                         |                                         |
| Interference emission                                     |                                        | EN 61000-6-4                                                   |                                         |                                         |
| high-frequency radiated                                   | DIN EN 55011                           | B/C1                                                           |                                         |                                         |
| high-frequency conducted                                  | DIN EN 55011                           | B/C1                                                           |                                         |                                         |

<sup>1)</sup> buffering time  $\approx \frac{\text{energy storage} \times 0.9}{\text{current} \times \text{output voltage}}$

## CP-B range

### Technical data

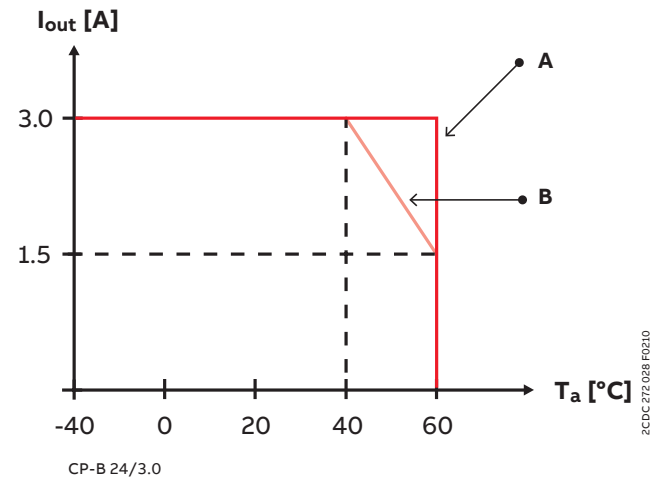
Data at  $T_a = 25\text{ °C}$  and rated values, unless otherwise indicated

| Type                                                       | CP-B EXT 2.0                                                 |                                                                  |
|------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------|
| Extension circuit                                          | EXT+ EXT+ EXT- EXT-                                          |                                                                  |
| Rated voltage                                              | 24 V DC                                                      |                                                                  |
| Voltage range                                              | 0-26.4 V DC                                                  |                                                                  |
| Rated current                                              | 3 A DC                                                       |                                                                  |
| Internal input fuse (apparatus protection, not accessible) | 4 A slow acting (PTC)                                        |                                                                  |
| Short-circuit protection                                   | via internal 3 A fuse                                        |                                                                  |
| Overload protection                                        | only in combination with CP-B 24/3.0 or CP-B 24/20.0         |                                                                  |
| Indication of operational states                           |                                                              |                                                                  |
|                                                            |                                                              | status information and fault messages of the buffer module apply |
| General data                                               |                                                              |                                                                  |
| Power consumption without load                             | 0.5 W                                                        |                                                                  |
| Energy storage (min.)                                      | 2000 Ws                                                      |                                                                  |
| Material                                                   | cover / housing shell                                        | steel sheet powdered                                             |
| Mounting                                                   | DIN rail (IEC/EN 60715), snap-on mounting                    |                                                                  |
| Mounting position                                          | horizontal                                                   |                                                                  |
| Minimum distance to other units                            | horizontal                                                   | not necessary                                                    |
|                                                            | vertical                                                     | 40 mm (1.58 in)                                                  |
| Pollution degree                                           | 2                                                            |                                                                  |
| Degree of protection                                       | housing / terminal                                           | IP20                                                             |
| Protection class (IEC/EN 61140)                            | III SELV / PELV (condition: power supply fulfills class III) |                                                                  |
| Electrical connection - Extension circuit                  | pull spring terminals                                        |                                                                  |
| Connecting capacity                                        | fine-strand with(out) wire end ferrule                       | 0.08-1.0 mm² (28-18 AWG)                                         |
|                                                            |                                                              | 0.08-1.5 mm² (28-16 AWG)                                         |
| Stripping length                                           | 6.0 mm (0.24 in)                                             |                                                                  |
| Environmental data                                         |                                                              |                                                                  |
| Ambient temperature                                        | operation                                                    | -40...+60 °C                                                     |
|                                                            | storage                                                      | -40...+60 °C                                                     |
| Vibration, sinusoidal                                      | IEC/EN 60068-2-6                                             | 1.5 mm, 3-57.55 Hz; 2 g, 57.55-500 Hz, 10 cycles                 |
| Shock, half-sine                                           | IEC/EN 60068-2-27                                            | 15 g, 11 ms, 3 axes, 6 faces, 3 times for each face              |
| Standards / Directives                                     |                                                              |                                                                  |
| Standards                                                  | EN 50178, IEC/EN 60950-1, IEC/EN 62040-2                     |                                                                  |
| Low Voltage Directive                                      | 2014/35/EU                                                   |                                                                  |
| 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 3, 6 kV / 8 kV                                             |
| radiated, radio-frequency, electromagnetic field           | IEC/EN 61000-4-3                                             | level 3, 10 V/m (27-1000 MHz) / level 2, 3 V/m (1400-2700 MHz)   |
| electrical fast transient/burst                            | IEC/EN 61000-4-4                                             | level 3, 2(1) kV / 5 kHz                                         |
| surge                                                      | IEC/EN 61000-4-5                                             | level 1, 0.5 kV                                                  |
| conducted disturbances, induced by radio-frequency fields  | IEC/EN 61000-4-6                                             | level 3, 10 V (150 kHz-80 MHz)                                   |
| voltage dips, short interruptions and voltage variations   | IEC/EN 61000-4-11                                            | buffered by ultra-capacitors                                     |
| Interference emission                                      | EN 61000-6-4                                                 |                                                                  |
| high-frequency radiated                                    | DIN EN 55011                                                 | B/C1                                                             |
| high-frequency conducted                                   | DIN EN 55011                                                 | B/C1                                                             |

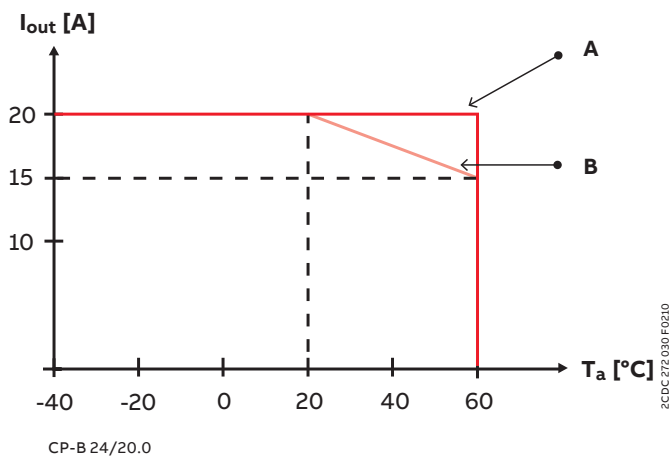
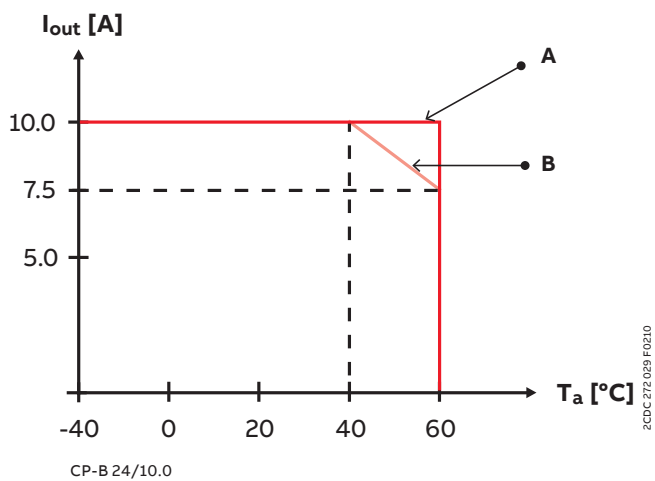
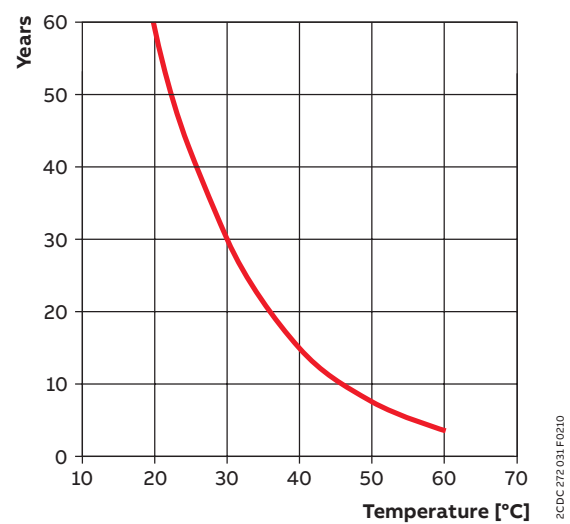
## CP-B range

### Technical diagrams

Characteristic curve of the temperature at rated load



Capacitors life span over temperature



- A Normal application (up to 50 % buffer mode, 5 charging and discharging cycles in direct series)
- B Continuous charging and discharging in direct series. As this is not typical of a real application, this should be considered as theoretical indication

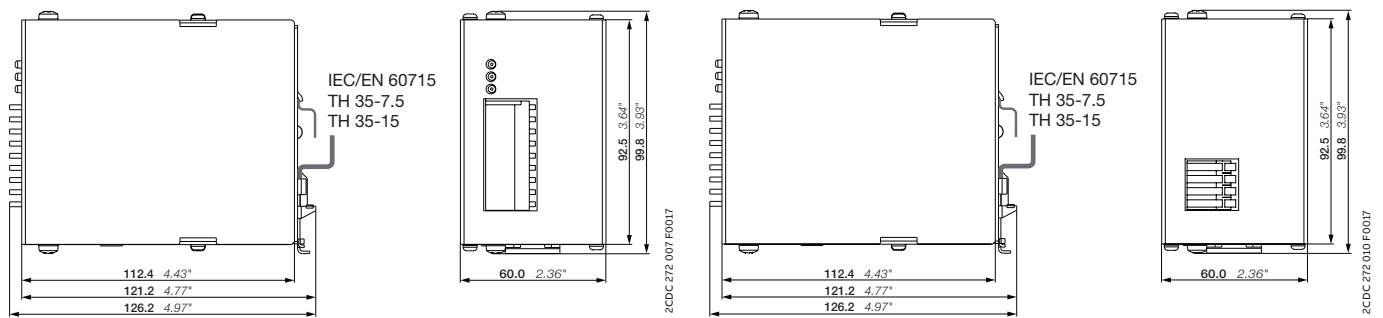


## CP-B range

### Technical diagrams

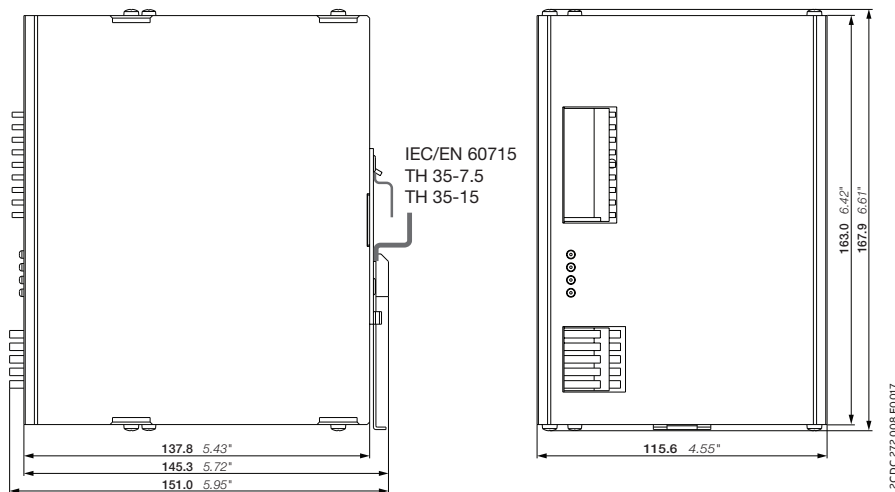
#### Dimensional drawings

Dimensions in **mm**, inches

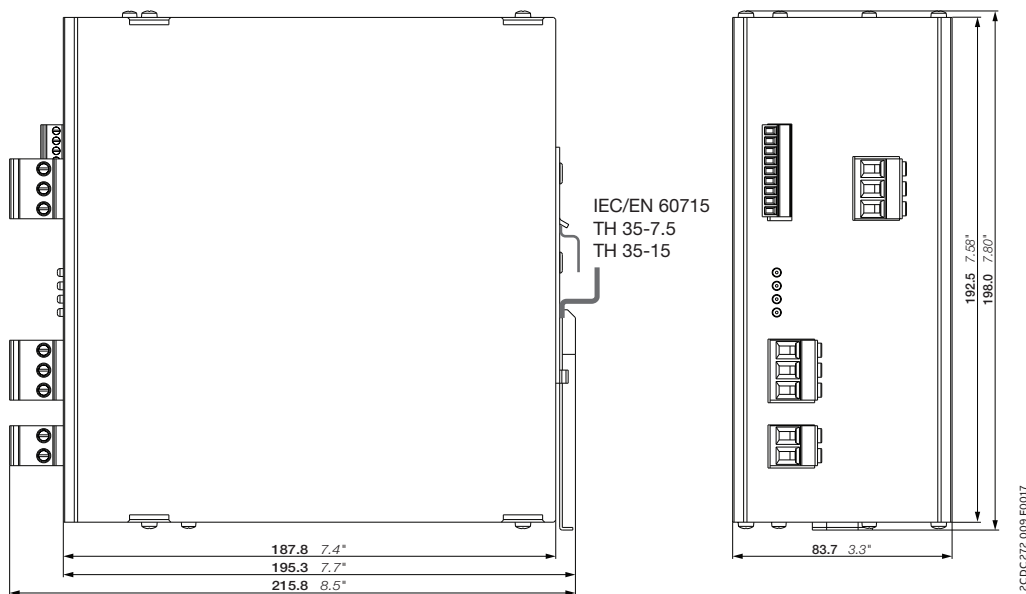


CP-B 24/3.0

CP-B EXT.2



CP-B 24/10.0



CP-B 24/20.0



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## Redundancy units

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| <b>342</b> | <b>Ordering details</b>        |
| <b>343</b> | <b>Technical data</b>          |
| <b>347</b> | <b>Technical diagrams</b>      |



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**Establish true redundancy  
where it really matters with  
ABB's power supply  
redundancy units.**





## Redundancy units

### Benefits and advantages



ABB's redundancy units are used to establish true redundancy, which increases the availability of electrical systems significantly. Three versions are available with different output currents and power supply housings:

- CP-D RU in MDRC housing
- CP-RUD for a true redundant setup of two 24 V DC power supplies with a max. output current of 2.5 A per channel
- CP-C.1-A-RU for a true redundant setup of two 24 V DC power supplies of the CP range



**Continuous  
operation**

#### **Highest system reliability**

- Redundancy setup of the application possible to allow parallel operation
- Long lifetime

## Redundancy units

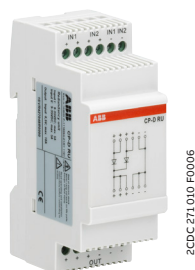
### Ordering details



CP-C.1-A-RU



CP-C.1-A-RU-L



CP-D RU



CP-RUD

#### Description

Whenever the highest availability and reliability are key requirements, a true redundancy setup with two power supplies connected to a redundancy unit is the best solution. In case one power supply fails, the other one keeps supplying the load. Furthermore, even a short circuit in one power supply will not affect the other one, which keeps supplying the load. The CP-C.1-A-RU is also available with coated PCBA (CP-C.1-A-RU-C) for harsh environments.

#### Ordering details - CP-C.1-A-RU for decoupling of CP power supplies up to 20 A per input / channel

| Input voltage range | Rated input current per channel | Rated output voltage / current       |          | Type          | Order code      | Weight (1 pc.)<br>kg (lb) |
|---------------------|---------------------------------|--------------------------------------|----------|---------------|-----------------|---------------------------|
| 10 - 28.5 V DC      | 20 A                            | 24 V DC /<br>2 x 20 A<br>or 1 x 40 A | uncoated | CP-C.1-A-RU   | 1SVR360060R1001 | 1.04<br>(2.29)            |
|                     |                                 |                                      | coated   | CP-C.1-A-RU-C | 1SVR360060R2001 | 1.04<br>(2.29)            |
|                     |                                 |                                      | uncoated | CP-C.1-A-RU-L | 1SVR361060R1001 | 1.04<br>(2.29)            |

#### Ordering details - CP-D RU for decoupling of two CP-D power supply units

| Input voltage range | Rated input current | Rated output voltage / current | Type    | Order code      | Weight (1 pc.)<br>kg (lb) |
|---------------------|---------------------|--------------------------------|---------|-----------------|---------------------------|
| 9-35 V DC           | 2 x 5 A             | 24 V DC / 1 x 10 A             | CP-D RU | 1SVR427049R0000 | 0.075<br>(0.165)          |

#### Ordering details - CP-RUD for decoupling of two CP-E power supply units ≤ 35 V and < 5 A

| Input voltage range | Rated input current | Rated output voltage / current | Type   | Order code      | Weight (1 pc.)<br>kg (lb) |
|---------------------|---------------------|--------------------------------|--------|-----------------|---------------------------|
| 5-35 V DC           | 0.5 - 2.5 A         | 24 V DC / 5 A                  | CP-RUD | 1SVR423418R9000 | 0.088<br>(0.195)          |



## Redundancy units

### Technical data

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

| Type                                                          | CP-C.1-A-RU, CP-C.1-A-RU-L             |                                               | CP-C.1-A-RU-C        |
|---------------------------------------------------------------|----------------------------------------|-----------------------------------------------|----------------------|
| <b>Input circuit - Supply circuit</b>                         |                                        |                                               |                      |
| <b>(+/, -/-)</b>                                              |                                        |                                               |                      |
| Rated input voltage U <sub>in</sub>                           |                                        | 24 V DC                                       |                      |
| Input voltage range                                           |                                        | 10-28.5 V DC                                  |                      |
| Rated input current I <sub>in</sub> per channel               | -25 °C ≤ T <sub>a</sub> ≤ 60 °C        | 20 A                                          |                      |
| Maximum input current per channel                             | -25 °C ≤ T <sub>a</sub> ≤ 40 °C        | 30 A                                          |                      |
|                                                               | -40 °C ≤ T <sub>a</sub> ≤ 40 °C        | -                                             | 30 A                 |
| Transient overvoltage protection                              |                                        | yes, varistor                                 |                      |
| <b>Output circuit</b>                                         |                                        |                                               |                      |
| <b>(+/-)</b>                                                  |                                        |                                               |                      |
| Rated output voltage U <sub>out</sub>                         |                                        | 24 V DC                                       |                      |
| Voltage drop input/output                                     |                                        | typ. 0.6 V, max. 0.9 V                        |                      |
| Rated output current I <sub>r</sub>                           | -25 °C ≤ T <sub>a</sub> ≤ 60 °C        | 2 x 20 A or 1 x 40 A                          |                      |
| Max. output current (Power reserve)                           | -25 °C ≤ T <sub>a</sub> ≤ 40 °C        | 2 x 30 A or 1 x 60 A                          |                      |
|                                                               | -40 °C ≤ T <sub>a</sub> ≤ 40 °C        | -                                             | 2 x 30 A or 1 x 60 A |
| Derating of the output current                                | 60 °C < T <sub>a</sub> ≤ 70 °C         | 2.5 % per Kelvin temperature increase         |                      |
| Resistance to reverse feed                                    |                                        | < 60 V                                        |                      |
| <b>General data</b>                                           |                                        |                                               |                      |
| Power loss                                                    | input 2 x 20 A                         | 23.0 W                                        |                      |
|                                                               | input 2 x 10 A                         | 9.4 W                                         |                      |
|                                                               | input 2 x 5 A                          | 4.1 W                                         |                      |
| MTBF                                                          | acc. to MIL 217 HDBK                   | on request                                    |                      |
| Dimensions                                                    |                                        | see "Dimensional drawings"                    |                      |
| Material of housing                                           | cover / housing shell / front          | aluminium / zinc-coated sheet steel / plastic |                      |
| Mounting                                                      |                                        | DIN rail (IEC/EN 60715), snap-on mounting     |                      |
| Mounting position                                             |                                        | 1 and 7                                       |                      |
| Minimum distance to other units                               | horizontal / vertical                  | 25 mm (0.98 in) / 25 mm (0.98 in)             |                      |
| Degree of protection (IEC/EN 60529)                           | housing / terminals                    | IP20 / IP20                                   |                      |
| Protection class (IEC/EN 61140)                               |                                        | III                                           |                      |
| <b>Electrical connection - Input circuit / Output circuit</b> |                                        |                                               |                      |
| Connecting capacity                                           | fine-strand with(out) wire end ferrule | 2.5-10 mm² (12-8 AWG)                         |                      |
|                                                               | rigid                                  | 2.5-16 mm² (12-6 AWG)                         |                      |
| Stripping length                                              |                                        | 10 mm (0.39 in)                               |                      |
| Tightening torque                                             |                                        | 1.2 Nm (10.5 lb.in)                           |                      |
| Recommended screw driver                                      |                                        | PH1 / Ø 4.0 x 0.8 mm (0.16 x 0.03 in)         |                      |

## Redundancy units

### Technical data

| Type                                                             |                  | CP-C.1-A-RU, CP-C.1-A-RU-L                                                               | CP-C.1-A-RU-C                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental data                                               |                  |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
| Ambient temperature range                                        | operation        | -25...+70 °C (-13... +158 °F)                                                            |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | rated load       | -25...+60 °C (-13... +140 °F)                                                            |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | storage          | -40...+85 °C (-40...+185 °F)                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | transportation   | -40...+85 °C (-40...+185 °F)                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-1)                                | storage          | 1K2 (-40...+85 °C / -40...+185 °F)                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-2)                                | transportation   | 2K2 (-40...+85 °C / -40...+185 °F)                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
| Climatic class (IEC/EN 60721-3-3)                                | operation        | 3K3 (-25...+70 °C / -13...+158 °F)                                                       | 3K3 (-40...+70 °C / -40...+158 °F)                                                                                                                                                                                                                                                                                                                                   |
| Damp heat, cyclic (IEC/EN 60068-2-30)                            |                  | test Db: 55 °C, 2 cycles                                                                 |                                                                                                                                                                                                                                                                                                                                                                      |
| Vibration (IEC/EN 60068-2-6)                                     |                  | test Fc: 10-58 Hz, amplitude ±0.15 mm, 58-150 Hz, 2 g, 10 sweep cycles each axis         |                                                                                                                                                                                                                                                                                                                                                                      |
| Shock, half-sine (IEC/EN 60068-2-27)                             |                  | test Ea: 30 g, 6 ms, 3 pulses each axis; bump 20 g, 11 ms, 100 pulses each axis          |                                                                                                                                                                                                                                                                                                                                                                      |
| Coated PCBA                                                      |                  | no                                                                                       | yes                                                                                                                                                                                                                                                                                                                                                                  |
| Gaseous corrosive environment withstand test (IEC/EN 60068-2-60) |                  | -                                                                                        | testing method: 4<br>testing period: 21 days<br>ambient conditions: 25 °C, 75 % r.h.<br>air/volume change rate per hour: 3-6<br>sample not energized during exposure<br>gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3<br>IEC 60721-3.3 acc. 3C2/3C3<br>- H2S ≥ 100 ± 10 ppb<br>- SO2/SO3 ≥ 300 ± 20 ppb<br>- Cl2 ≥ 100 ± 10 ppb<br>- NOx ≥ 1250 ± 20 ppb |
| Isolation data                                                   |                  |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
| Rated impulse withstand voltage U <sub>imp</sub> (EN 50178)      | input / housing  | 1.5 kV (1.2/50 μs)                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                  | output / housing | 1.5 kV (1.2/50 μs)                                                                       |                                                                                                                                                                                                                                                                                                                                                                      |
| Pollution degree                                                 |                  | 2                                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |
| Standards / Directives                                           |                  |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
| Standards                                                        |                  | IEC/EN 61204                                                                             |                                                                                                                                                                                                                                                                                                                                                                      |
| EMC Directive                                                    |                  | 2014/30/EU                                                                               |                                                                                                                                                                                                                                                                                                                                                                      |
| ATEX Directive                                                   |                  | -                                                                                        | 2014/34/EU                                                                                                                                                                                                                                                                                                                                                           |
| RoHS Directive                                                   |                  | 2011/65/EU                                                                               |                                                                                                                                                                                                                                                                                                                                                                      |
| Electrical safety                                                |                  | IEC/EN 60950-1                                                                           |                                                                                                                                                                                                                                                                                                                                                                      |
| Industrial control equipment / General Use Power Supplies        |                  | UL 508 / CSA 22.2 No 107.1                                                               |                                                                                                                                                                                                                                                                                                                                                                      |
| Electromagnetic compatibility                                    |                  |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
| Interference immunity to                                         |                  |                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |
| electrostatic discharge                                          | IEC/EN 61000-4-2 | Level 4, contact discharge ±8 kV, air discharge ±15 kV (criterion B)                     |                                                                                                                                                                                                                                                                                                                                                                      |
| electrical fast transient / burst                                | IEC/EN 61000-4-4 | Level 3, DC mains inputs and output ±2 kV (criterion B)                                  |                                                                                                                                                                                                                                                                                                                                                                      |
| surge                                                            | IEC/EN 61000-4-5 | Level 1, DC mains inputs and output ±0.5 kV, input and output vs. PE ±1 kV (criterion B) |                                                                                                                                                                                                                                                                                                                                                                      |

## Redundancy units

### Technical data

|                                                               |                                        |                                                                                    |
|---------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------|
| <b>Type</b>                                                   |                                        | <b>CP-D RU</b>                                                                     |
| <b>Input circuit - Supply circuit</b>                         |                                        | <b>IN 1 + + -, IN 2 + + -</b>                                                      |
| Rated input voltage $U_{in}$                                  |                                        | 24 V DC                                                                            |
| Input voltage range                                           |                                        | 9-35 V DC                                                                          |
| Rated input current $I_{in}$ per channel                      |                                        | 5 A                                                                                |
| Maximum input current per channel                             |                                        | 10 A for 300 s                                                                     |
| Transient overvoltage protection                              |                                        | no                                                                                 |
| <b>Output circuit</b>                                         |                                        | <b>OUT + + +, - - -</b>                                                            |
| Rated output voltage $U_{out}$                                |                                        | 24 V DC                                                                            |
| Voltage drop                                                  |                                        | typ. 0.5 V                                                                         |
| Rated output current $I_{out}$                                |                                        | 10 A                                                                               |
| Resistance to reverse feed                                    |                                        | < 35 V                                                                             |
| <b>General data</b>                                           |                                        |                                                                                    |
| MTBF                                                          |                                        | on request                                                                         |
| Duty cycle                                                    |                                        | 100 %                                                                              |
| Dimensions                                                    |                                        | see "Dimensional drawings"                                                         |
| Material of housing                                           |                                        | plastic                                                                            |
| Mounting                                                      |                                        | DIN rail, snap-on mounting without any tool                                        |
| Mounting position                                             |                                        | 1, 7                                                                               |
| Minimum distance to other units                               | horizontal / vertical                  | 25 mm (0.98 in) / 25 mm (0.98 in)                                                  |
| <b>Electrical connection - Input circuit / Output circuit</b> |                                        |                                                                                    |
| Connecting capacity                                           | fine-strand with (out)wire end ferrule | 0.2-2.5 mm <sup>2</sup> (24-14 AWG)                                                |
|                                                               | rigid                                  | 0.2-2.5 mm <sup>2</sup> (24-12 AWG)                                                |
| Stripping length                                              |                                        | 7.0 mm (0.28 in)                                                                   |
| Tightening torque                                             |                                        | 0.67 Nm (6 lb.in)                                                                  |
| <b>Environmental data</b>                                     |                                        |                                                                                    |
| Ambient temperature range                                     | operation                              | -40...+70 °C                                                                       |
|                                                               | storage                                | -40...+85 °C                                                                       |
| Relative humidity                                             | RH at 40 °C                            | 20-95 %, no condensation                                                           |
| Vibration (IEC/EN 60068-2-6)                                  |                                        | mounting by rail:<br>10-500 Hz, 2 G, along X, Y, Z each axis, 60 min for each axis |
| Shock (IEC/EN 60068-2-27)                                     |                                        | 15 G, 11 ms, 3 axis, 6 faces, 3 times for each face                                |
| <b>Standards / Directives</b>                                 |                                        |                                                                                    |
| Standards                                                     |                                        | IEC/EN 61204-3, IEC/EN 60950-1                                                     |
| RoHS Directive                                                |                                        | 2011/65/EU                                                                         |
| <b>Electromagnetic compatibility</b>                          |                                        |                                                                                    |
| Interference immunity to                                      |                                        | EN 55024                                                                           |
| electrostatic discharge                                       | IEC/EN 61000-4-2                       | level 3, air discharge 8 kV, contact discharge 4 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 3, 2 kV / 5 kHz                                                              |
| conducted disturbances, induced by radio-frequency fields     | IEC/EN 61000-4-6                       | level 3, 10 V                                                                      |
| Interference emission                                         |                                        | EN 55022                                                                           |
| high-frequency radiated                                       | IEC/CISPR 22 / EN 55022                | class B                                                                            |
| high-frequency conducted                                      | IEC/CISPR 22 / EN 55022                | class B                                                                            |

## Redundancy units

### Technical data

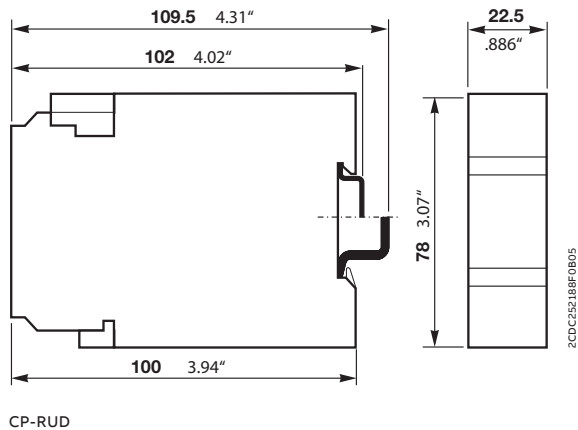
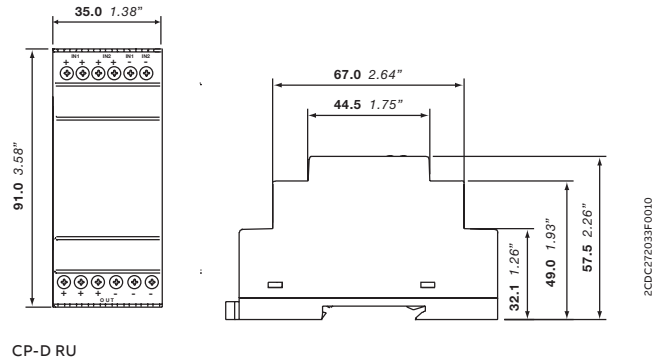
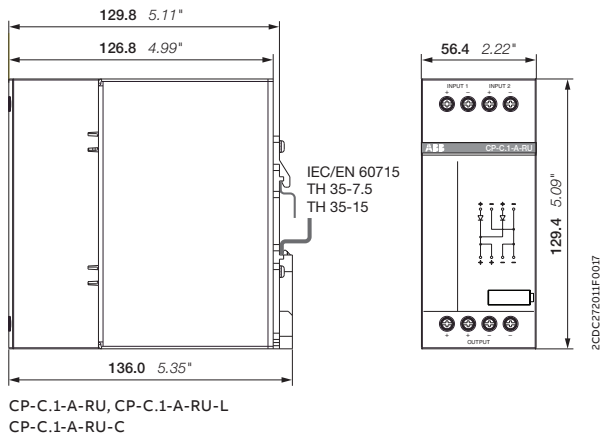
| Type                                                      |                                      | CP-RUD                                                 |
|-----------------------------------------------------------|--------------------------------------|--------------------------------------------------------|
| Input circuit - Supply circuit                            |                                      | A: U1+/-U ; B: U2+/-U                                  |
| Rated input voltage U <sub>in</sub>                       |                                      | 24 V DC                                                |
| Input voltage range                                       |                                      | 5-35 V DC                                              |
| Rated input current I <sub>in</sub> per channel           |                                      | 0.5-2.5 A                                              |
| Maximum input current per channel                         |                                      | 10 A for 300 s                                         |
| Transient overvoltage protection                          |                                      | no                                                     |
| Output circuit                                            |                                      | L+, L+, L+, L-, L-, L-                                 |
| Rated output voltage U <sub>out</sub>                     |                                      | 24 V DC                                                |
| Voltage drop                                              |                                      | typ. 0.6 V, max. 0.7 V                                 |
| Rated output current I <sub>out</sub>                     |                                      | 0.5-5 A                                                |
| Peak output current                                       |                                      | 20 A for 150 s                                         |
| Resistance to reverse feed                                |                                      | < 35 V                                                 |
| General data                                              |                                      |                                                        |
| Dimensions                                                |                                      | see "Dimensional drawings"                             |
| Minimum distance to other units                           | horizontal / vertical                | 10 mm / 10 mm (0.39 in / 0.39 in)                      |
| Degree of protection                                      | housing / terminals                  | IP20 / IP20                                            |
| Material of housing                                       | housing shell / cover                | plastic / plastic                                      |
| Protection class                                          |                                      | -                                                      |
| Mounting                                                  |                                      | DIN rail (IEC/EN 60715)                                |
| Mounting position                                         |                                      | horizontal                                             |
| Electrical connection - Input circuit / Output circuit    |                                      |                                                        |
| Connecting capacity                                       | fine-strand with wire end ferrule    | 2 x 0.75-2.5 mm² (2 x 18-14 AWG)                       |
|                                                           | fine-strand without wire end ferrule |                                                        |
|                                                           | rigid                                | 2 x 0.5-4 mm² (2 x 20-12 AWG)                          |
| Stripping length                                          |                                      | 7 mm (0.28 in)                                         |
| Tightening torque                                         |                                      | 0.6-0.8 Nm                                             |
| Environmental data                                        |                                      |                                                        |
| Ambient temperature range                                 | operation                            | -20...+60 °C                                           |
|                                                           | rated load                           | -20...+60 °C                                           |
|                                                           | storage                              | -40...+85 °C                                           |
| Damp heat (IEC/EN 60068-2-3)                              |                                      | 93 % at 40 °C, no condensation                         |
| Isolation data                                            |                                      |                                                        |
| Insulation voltage                                        | input / output / housing             | -                                                      |
| Pollution degree (EN 50178)                               |                                      | 2                                                      |
| Standards / Directives                                    |                                      |                                                        |
| Electrical safety                                         |                                      | EN 50178                                               |
| RoHS Directive                                            |                                      | 2011/65/EU                                             |
| Electromagnetic compatibility                             |                                      |                                                        |
| Interference immunity to                                  |                                      | IEC/EN 61000-6-2                                       |
| electrostatic discharge                                   | IEC/EN 61000-4-2                     | level 3 (air discharge ±8 kV, contact discharge ±6 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 3 (±2 kV)                                        |
| surge                                                     | IEC/EN 61000-4-5                     | level 1 (±0.5 kV)                                      |
| 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                                   |                                      | class B                                                |
| high-frequency conducted                                  |                                      | class B                                                |

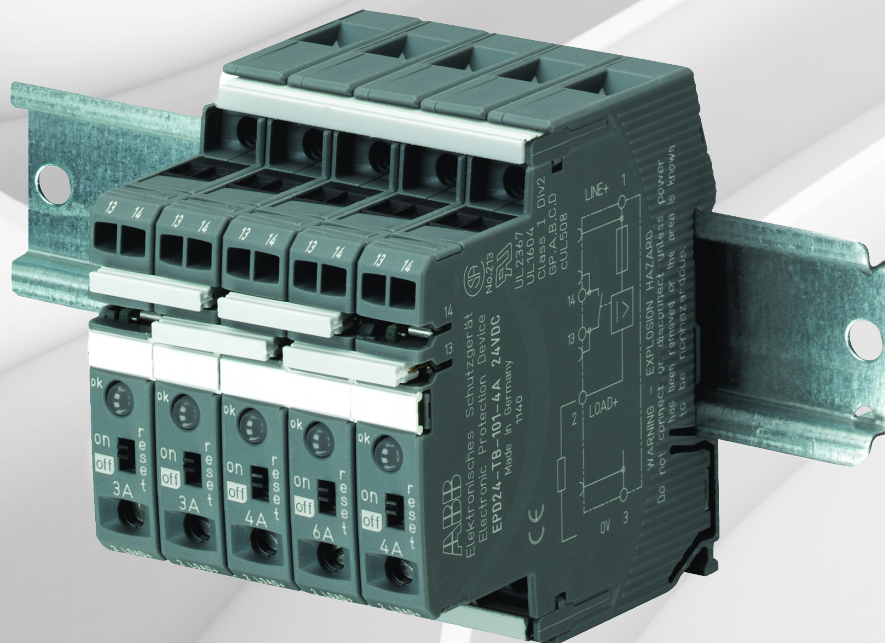
## Redundancy units

### Technical diagrams

#### Dimensional drawings

Dimensions in mm, inches







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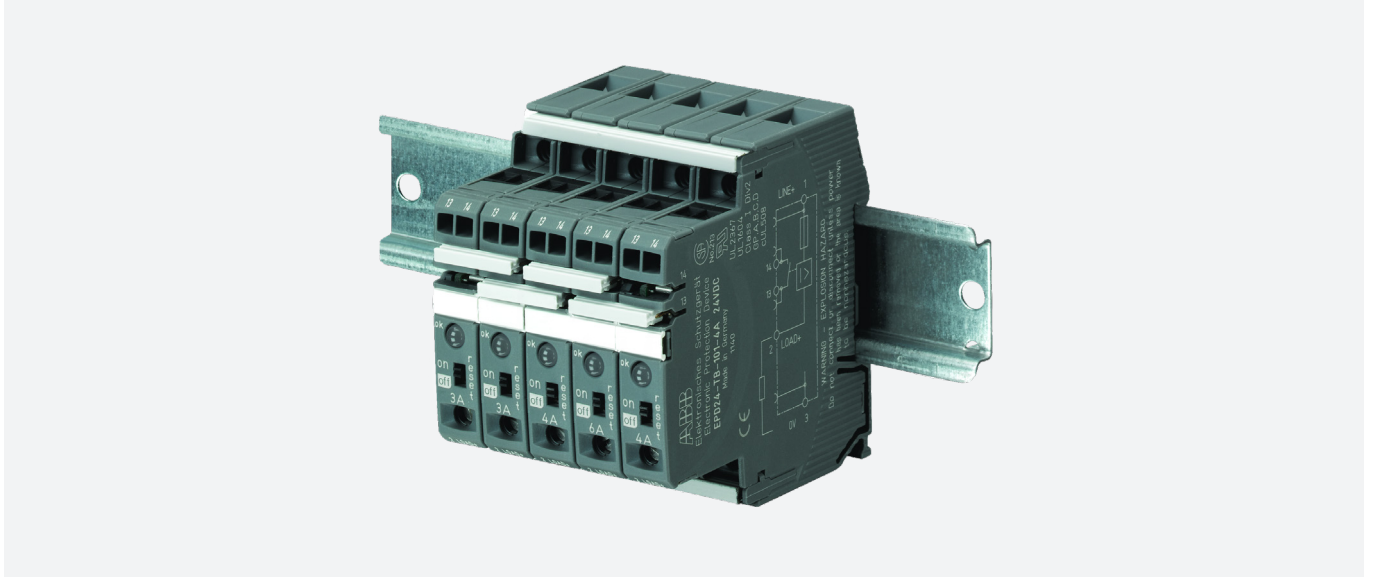
# Electronic protection devices EPD24

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# Electronic protection devices EPD24

## Benefits and advantages



With its narrow width of only 12.5 mm, EPD24 can fit everywhere – it can even be mounted side-by-side.

Its adjustable and fixed current ratings, projectable protection through current limitation as well as a single trip curve for all types of loads allow for use in a wide field of applications.



**Continuous  
operation**

### Highlights

- Safety and reliability
- Operational continuity
- Worldwide use thanks to relevant certifications
- Compact and effective

# Electronic protection devices EPD24

## Applications



### Features

- Selective load protection, one electronic tripping characteristic.
- Active current limitation for safe connection of capacitive loads up to 20,000  $\mu\text{F}$  and on overload/short circuit
- Current ratings 0.5...12 A
- Reliable overload disconnection with  $1.1 \times I_N$
- Manual ON/OFF button
- Clear status and failure indication through LED and integrated auxiliary contact
- Integral fail-safe element adjusted to current rating
- Width per unit only 12.5 mm
- Rail mounting
- Ease of wiring through busbar LINE+ and 0 V as well as signal bars
- UL- and CSA-approvals allow international use of the devices



### Applications

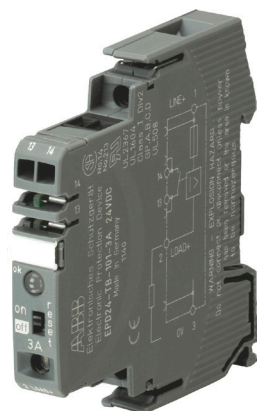
- Packaging machines
- Automation
- Automation & Process Control
- Automotive Manufacturing
- Chemical, Oil & Gas
- Medical Equipment
- Pharmaceutical & Food
- Power Engineering DC 24 V
- Renewable Energy
- Steel Production





## Electronic protection devices EPD24

### Ordering details



EPD24-TB-101-3A

2CDC 051 001 S0010

#### Description

The protection devices EPD24 extend the ABB product range of modular DIN rail components by electronic overcurrent protection modules for selective protection of 24 V DC load circuits. This protection is achieved by a combination of active electronic current limitation in the case of a short circuit and an overload deactivation from  $1.1 \times I_n$  upwards.

If a fault occurs in a load circuit, the protection device EPD24 will detect this rapidly and reliably, then disable the power output transistor and hence interrupt the current flow in the defective circuit. The maximum possible overcurrent is always limited to 1.3...1.8 times the selected rated current. An activation of capacitive loads up to 20,000  $\mu\text{F}$  is possible, deactivation only occurring in the case of overloads or short circuits. Selective deactivation of the defective current circuit means undefined error states and a complete system stop are prevented.

#### Ordering details

| Rated current $I_N$<br>A | bbn 40 16779 EAN | Type              | Order code      | Pkg<br>qty | Weight<br>(1 pc.)<br>kg (lb) |
|--------------------------|------------------|-------------------|-----------------|------------|------------------------------|
| 0.5                      | 829960           | EPD24-TB-101-0.5A | 2CDE601101R2905 | 4          | 0.065<br>(1.433)             |
| 1                        | 829984           | EPD24-TB-101-1A   | 2CDE601101R2001 | 4          | 0.065<br>(1.433)             |
| 2                        | 830003           | EPD24-TB-101-2A   | 2CDE601101R2002 | 4          | 0.065<br>(1.433)             |
| 3                        | 830027           | EPD24-TB-101-3A   | 2CDE601101R2003 | 4          | 0.065<br>(1.433)             |
| 4                        | 830041           | EPD24-TB-101-4A   | 2CDE601101R2004 | 4          | 0.065<br>(1.433)             |
| 6                        | 830065           | EPD24-TB-101-6A   | 2CDE601101R2006 | 4          | 0.065<br>(1.433)             |
| 8                        | 830089           | EPD24-TB-101-8A   | 2CDE601101R2008 | 4          | 0.065<br>(1.433)             |
| 10                       | 830102           | EPD24-TB-101-10A  | 2CDE601101R2010 | 4          | 0.065<br>(1.433)             |
| 12                       | 830126           | EPD24-TB-101-12A  | 2CDE601101R2012 | 4          | 0.065<br>(1.433)             |

| Description                                                             | bbn 40<br>16779 EAN | Type      | Order code      | Pkg<br>qty | Weight<br>(1 pc.)<br>kg (lb) |
|-------------------------------------------------------------------------|---------------------|-----------|-----------------|------------|------------------------------|
| Busbars for LINE+ and 0 V, grey insulation, length 500 mm <sup>1)</sup> | 830140              | EPD-BB500 | 2CDE605100R0500 | 10         | 0.2<br>(0.441)               |
| Signal bars for aux. contacts, grey insulation, length 21 mm            | 830164              | EPD-SB21  | 2CDE605200R0021 | 10         | 0.4<br>(0.882)               |

<sup>1)</sup> Max. load with one line entry  $I_{max} = 50 \text{ A}$  (recommended: mid line entry)  
Max. load with two line entries  $I_{max} = 63 \text{ A}$

## Electronic protection devices EPD24

### Operating data

| Operating data                                         |                                                                                                                                                        |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operating voltage $U_B$                                | 24 V DC (18...32 V)                                                                                                                                    |
| Current rating $I_N$                                   | fixed current ratings: 0.5, 1, 2, 3, 4, 6, 8, 10, 12 A                                                                                                 |
| Closed current $I_0$                                   | ON condition: typically 20...30 mA depending on signal output                                                                                          |
| Status indication by means of                          | Green: unit is ON<br>load circuit / Power-MOSFET is switched on                                                                                        |
|                                                        | Orange: in the event of overload or short circuit until electronic disconnection                                                                       |
|                                                        | Red: unit electronically disconnected<br>load circuit/Power-MOSFET OFF<br>undervoltage ( $U_B < 8$ V) after switch-on till the end of the delay period |
|                                                        | OFF: manually switched off or device is dead                                                                                                           |
|                                                        | potential-free auxiliary contact F                                                                                                                     |
|                                                        | ON/OFF/ condition of switch                                                                                                                            |
| Load circuit                                           |                                                                                                                                                        |
| Load output                                            | Power-MOSFET switching output (high side switch)                                                                                                       |
| Overload disconnection                                 | typically $1.1 \times I_N$ (1.05...1.35 $\times I_N$ )                                                                                                 |
| Short-circuit current $I_K$                            | active current limitation                                                                                                                              |
| Trip time                                              | see time/current characteristics                                                                                                                       |
| For electronic disconnection                           | typically 3 s at $I_{Load} > 1.1 \times I_N$<br>typically 100 ms...3 s at $I_{Load} > 1.8 \times I_N$ (or $1.5 \times I_N / 1.3 \times I_N$ )          |
| Temperature disconnection                              | internal temperature monitoring with electronic disconnection                                                                                          |
| Low voltage monitoring load output                     | with hysteresis, no reset required: load »OFF« at $U_B < 8$ V                                                                                          |
| Starting delay $t_{Start}$                             | typically 0.5 sec after every switch-on and after applying $U_B$                                                                                       |
| Disconnection of load circuit                          | electronic disconnection                                                                                                                               |
| Free-wheeling circuit                                  | suitable external free-wheeling circuit to be used with inductive load                                                                                 |
| Several load outputs must not be connected in parallel |                                                                                                                                                        |
| Signal output                                          |                                                                                                                                                        |
| Electrical data                                        | potential-free auxiliary contact<br>max. 30 V DC/0.5 A, min. 10 V DC/10 mA                                                                             |
| ON condition LED green                                 | voltage $U_B$ applied, switch is in ON position<br>no overload, no short circuit                                                                       |
| OFF condition LED off                                  | device switched off (switch is in OFF position)<br>no voltage $U_B$ applied                                                                            |
| Fault condition LED orange                             | overload condition $> 1.1 \times I_N$ up to electronic disconnection                                                                                   |
| Fault condition LED red                                | electronic disconnection upon overload or short circuit<br>Device switched off with control signal (switch is in ON position)                          |
| Aux. contact                                           | single signal, make contact<br>contact open, terminal 13-14                                                                                            |
| Fault                                                  | signal output fault conditions<br>no operating voltage $U_B$<br>ON/OFF switch is in OFF position<br>red LED lighted (electronic disconnection)         |

## Electronic protection devices EPD24

### Technical data

| General data                                                                |                                                                                                                                                                                      |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fail-Safe element                                                           | backup fuse for EPD24 not required because of the integral redundant fail-safe element                                                                                               |
| Housing material                                                            | moulded                                                                                                                                                                              |
| Mounting                                                                    | symmetrical rail to EN 50022-35x7.5                                                                                                                                                  |
| Ambient temperature                                                         | 0...+50 °C (without condensation, see EN 60204-1)                                                                                                                                    |
| Storage temperature                                                         | -20...+70 °C                                                                                                                                                                         |
| Humidity                                                                    | 96 hrs/95 % RH/40 °C to IEC 60068-2-78, test Cab. climate class 3K3 to EN 60721                                                                                                      |
| Vibration                                                                   | 3 g, test to IEC 60068-2-6 test Fc                                                                                                                                                   |
| Degree of protection                                                        | housing: IP20 DIN 40050<br>terminals: IP20 DIN 40050                                                                                                                                 |
| EMC<br>(EMC directive, CE logo)                                             | emission: EN 61000-6-3<br>susceptibility: EN 61000-6-2                                                                                                                               |
| Isolations coordination<br>(IEC 60934)                                      | 0.5 kV/pollution degree 2<br>reinforced insulation in operating area                                                                                                                 |
| Dielectric strength                                                         | max. 32 V DC (load circuit)                                                                                                                                                          |
| Isolation resistance (OFF condition)                                        | n/a, only electronic disconnection                                                                                                                                                   |
| Approvals/Declarations of conformity                                        | UL 2367 Solid State Overcurrent Protectors<br>UL 1604, (class I, division 2, groups A, B, C, D)<br>UL 508<br>CSA C22.2 No. 213 (class I, division 2)<br>CSA C22.2 No. 142<br>CE logo |
| Dimensions (B x H x T)                                                      | 12.5 x 80 x 83 mm                                                                                                                                                                    |
| Weight                                                                      | approx. 65 g                                                                                                                                                                         |
| Terminals                                                                   | Line+/LOAD+/0V                                                                                                                                                                       |
| Screw terminals                                                             | M4                                                                                                                                                                                   |
| Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve | 0.5 – 10 mm <sup>2</sup>                                                                                                                                                             |
| Multi-lead connection (2 identical cables) rigid/flexible                   | 0.5 – 4 mm <sup>2</sup>                                                                                                                                                              |
| Flexible with wire end ferrule without plastic sleeve                       | 0.5 – 2.5 mm <sup>2</sup>                                                                                                                                                            |
| Flexible with TWIN wire end ferrule with plastic sleeve                     | 0.5 – 6 mm <sup>2</sup>                                                                                                                                                              |
| Wire stripping length                                                       | 10 mm                                                                                                                                                                                |
| Tightening torque (EN 60934)                                                | 1.5 – 1.8 Nm                                                                                                                                                                         |
| Terminals                                                                   | aux. contacts                                                                                                                                                                        |
| Screw terminals                                                             | M3                                                                                                                                                                                   |
| Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve | 0.25 - 2.5 mm <sup>2</sup>                                                                                                                                                           |
| Wire stripping length                                                       | 8 mm                                                                                                                                                                                 |
| Tightening torque (EN 60934)                                                | 0.5 Nm                                                                                                                                                                               |

**Table 1: voltage drop, current limitation, max. load current**

| current rating<br>$I_N$ | typically voltage drop<br>$U_{ON}$ at $I_N$ | active current<br>limitation (typically) | max. load current at 100 % ON duty |                              |
|-------------------------|---------------------------------------------|------------------------------------------|------------------------------------|------------------------------|
|                         |                                             |                                          | $T_{ambient} = 40\text{ °C}$       | $T_{ambient} = 40\text{ °C}$ |
| 0.5 A                   | 70 mV                                       | $1.8 \times I_N$                         | 0.5 A                              | 0.5 A                        |
| 1 A                     | 80 mV                                       | $1.8 \times I_N$                         | 1 A                                | 1 A                          |
| 2 A                     | 130 mV                                      | $1.8 \times I_N$                         | 2 A                                | 2 A                          |
| 3 A                     | 80 mV                                       | $1.8 \times I_N$                         | 3 A                                | 3 A                          |
| 4 A                     | 100 mV                                      | $1.8 \times I_N$                         | 4 A                                | 4 A                          |
| 6 A                     | 130 mV                                      | $1.8 \times I_N$                         | 6 A                                | 5 A                          |
| 8 A                     | 120 mV                                      | $1.5 \times I_N$                         | 8 A                                | 7 A                          |
| 10 A                    | 150 mV                                      | $1.5 \times I_N$                         | 10 A                               | 9 A                          |
| 12 A                    | 180 mV                                      | $1.3 \times I_N$                         | 12 A                               | 10.8 A                       |

Attention: when mounted side-by-side without convection, the ERD24 should carry no more than 80 % of its rated load with 100 % ON duty due to thermal effects.



## Electronic protection devices EPD24

### Technical information

#### Time/Current characteristic curve (T<sub>ambient</sub> = 25 °C)

The trip time is typically 3 s in the range between  $1.1 \times I_N$  and  $1.8 \times I_N$ <sup>1)</sup>.

Electronic current limitation occurs at typically  $1.8 \times I_N$ <sup>1)</sup> which means that under all overload conditions (independent of the power supply and the resistance of the load circuit) the max. overload before disconnection will not exceed  $1.8 \times I_N$ <sup>1)</sup> times the current rating. Trip time is between 100 ms and 3 sec (depending on overload or at short circuit).

Without this current limitation a considerably higher overload current would flow in the event of an overload or short circuit.

#### Maximum cable lengths

EPD24 reliably trips from 0 Ω up to max. circuit resistance R<sub>max</sub>.

#### Calculation of R<sub>max</sub>

|                                                                                  |      |      |
|----------------------------------------------------------------------------------|------|------|
| Selected rating I <sub>N</sub> (A)                                               | 3    | 6    |
| Operating voltage U <sub>s</sub> (V DC) (= 80 % of 24 V) <sup>2)</sup>           | 19.2 | 19.2 |
| Trip current I <sub>ab</sub> = 1.25 x I <sub>N</sub> (A) (EPD24 trips after 3 s) | 3.75 | 7.50 |
| R <sub>max</sub> (Ω) = (U <sub>s</sub> /I <sub>ab</sub> ) - 0.050                | 5.07 | 2.51 |

<sup>2)</sup> Voltage drop of EPD24 and tolerance of trip point (typically  $1.1 \times I_N = 1.05 \dots 1.35 \times I_N$ ) have been taken into account

#### Selection table for the incoming cable lengths with different cable cross-sections

| Cable cross section A (mm <sup>2</sup> ) | 0.14                                                              | 0.25  | 0.34  | 0.5   | 0.75  | 1.00 | 1.50 |
|------------------------------------------|-------------------------------------------------------------------|-------|-------|-------|-------|------|------|
| Cable length L (m) (= single length)     | cable resistance (Ω) = (ρ <sub>0</sub> x 2 x L) / A <sup>3)</sup> |       |       |       |       |      |      |
| 5                                        | 1.27                                                              | 0.71  | 0.52  | 0.36  | 0.24  | 0.18 | 0.12 |
| 10                                       | 2.54                                                              | 1.42  | 1.05  | 0.71  | 0.47  | 0.36 | 0.24 |
| 15                                       | 3.81                                                              | 2.14  | 1.57  | 1.07  | 0.71  | 0.53 | 0.36 |
| 20                                       | 5.09                                                              | 2.85  | 2.09  | 1.42  | 0.95  | 0.71 | 0.47 |
| 25                                       | 6.36                                                              | 3.56  | 2.62  | 1.78  | 1.19  | 0.89 | 0.59 |
| 30                                       | 7.63                                                              | 4.27  | 3.14  | 2.14  | 1.42  | 1.07 | 0.71 |
| 35                                       | 8.90                                                              | 4.98  | 3.66  | 2.49  | 1.66  | 1.25 | 0.83 |
| 40                                       | 10.17                                                             | 5.70  | 4.19  | 2.85  | 1.90  | 1.42 | 0.95 |
| 45                                       | 11.44                                                             | 6.41  | 4.71  | 3.20  | 2.14  | 1.60 | 1.07 |
| 50                                       | 12.71                                                             | 7.12  | 5.24  | 3.56  | 2.37  | 1.78 | 1.19 |
| 75                                       | 19.07                                                             | 10.68 | 7.85  | 5.34  | 3.56  | 2.67 | 1.78 |
| 100                                      | 25.34                                                             | 14.24 | 10.47 | 7.12  | 4.75  | 3.56 | 2.37 |
| 125                                      | 31.79                                                             | 17.80 | 13.09 | 8.90  | 5.93  | 4.45 | 2.97 |
| 150                                      | 38.14                                                             | 21.36 | 15.71 | 10.68 | 7.12  | 5.34 | 3.56 |
| 175                                      | 44.50                                                             | 24.92 | 18.32 | 12.46 | 8.31  | 6.23 | 4.15 |
| 200                                      | 50.86                                                             | 28.48 | 20.94 | 14.24 | 9.49  | 7.12 | 4.75 |
| 225                                      | 57.21                                                             | 32.04 | 23.56 | 16.02 | 10.68 | 8.01 | 5.34 |
| 250                                      | 63.57                                                             | 35.60 | 26.18 | 17.80 | 11.87 | 8.90 | 5.93 |

<sup>3)</sup> Resistivity of copper ρ<sub>0</sub> = 0.0178 (Ω x mm<sup>2</sup>)/m

Example 1: max. length for 1.5 mm<sup>2</sup> and 3 A: 214 m

Example 2: max. length for 1.5 mm<sup>2</sup> and 6 A: 106 m

Example 3: mixed wiring: (Control cabinet --- sensor/actuator level)

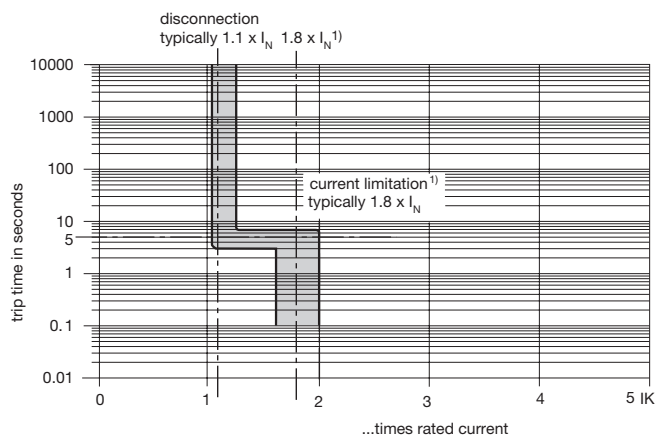
R1 = 40 m for 1.5 mm<sup>2</sup> and R2 = 5 m for 0.25 mm<sup>2</sup>:

R1 = 0.95 Ω, R2 = 0.71 Ω, total (R1 + R2) = 1.66 Ω

## Electronic protection devices EPD24

### Technical diagrams

#### Time/Current characteristic curve

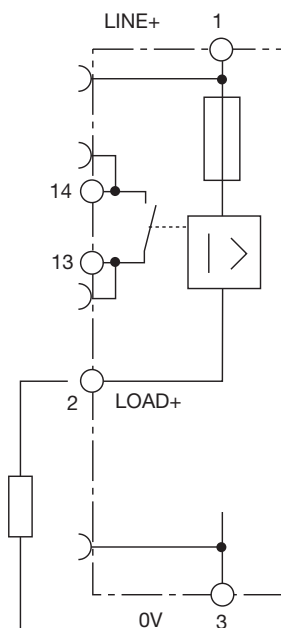


<sup>1)</sup> Current limitation typically  $1.8 \times I_N$  at  $I_N = 0.5 \text{ A} \dots 6 \text{ A}$   
 Current limitation typically  $1.5 \times I_N$  at  $I_N = 8 \text{ A}$  or  $10 \text{ A}$   
 Current limitation typically  $1.3 \times I_N$  at  $I_N = 12 \text{ A}$

#### Wiring diagram

EPD24-TB-101  
 without signal input  
 with signal output F  
 (Single signal, N/O)

Operating condition: 13-14 closed  
 Fault condition: 13-14 open



## Electronic protection devices EPD24

### Approvals, Safety instructions

#### Please note

The user must ensure that the cable cross sections of the relevant load circuit are suitable for the current rating of the EPD24 used. Automatic start-up of machinery after shut down must be prevented (Machinery Directive 2006/42/EU and IEC/EN 60204-1). In the event of a short circuit or overload the load circuit will be disconnected electronically by the EPD24.

#### Information on UL approvals/CSA approvals



UL1604  
UL File # E 339238



CSA C22.2 No. 213 (Class I, Division 2)  
CSA File # 2305929

#### Operating Temperature Code T5

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D or non-hazardous locations only

#### WARNING:

- Exposure to some chemicals may degrade the sealing properties of materials used in the following device: relay  
Sealant Material:
  - Generic Name: Modified diglycidyl ether of bisphenol A
  - Supplier: Fine Polymers Corporation
  - Type: Epi Fine 4616L-160PK
- Casing Material:
  - Generic Name: Liquid Crystal Polymer
  - Supplier: Sumitomo Chemical
  - Type: E4008, E4009, or E6008

#### RECOMMENDATION:

- Periodically inspect the device named above for any degradation of properties and replace if degradation is found

#### WARNING – EXPLOSION HAZARD:

- Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous
- Substitution of any components may impair suitability for Class I, Division 2



UL2367  
Non-hazardous use - UL File # E 339236



UL 508  
Non-hazardous use - UL File # E 149922



CSA C22.2 No. 14  
CSA C22.2 No. 142 - CSA File # E 2305929

#### Class 2

Meets requirement for Class 2 current limitation (EPD24 ... -0,5 A/1 A/2 A/3 A)

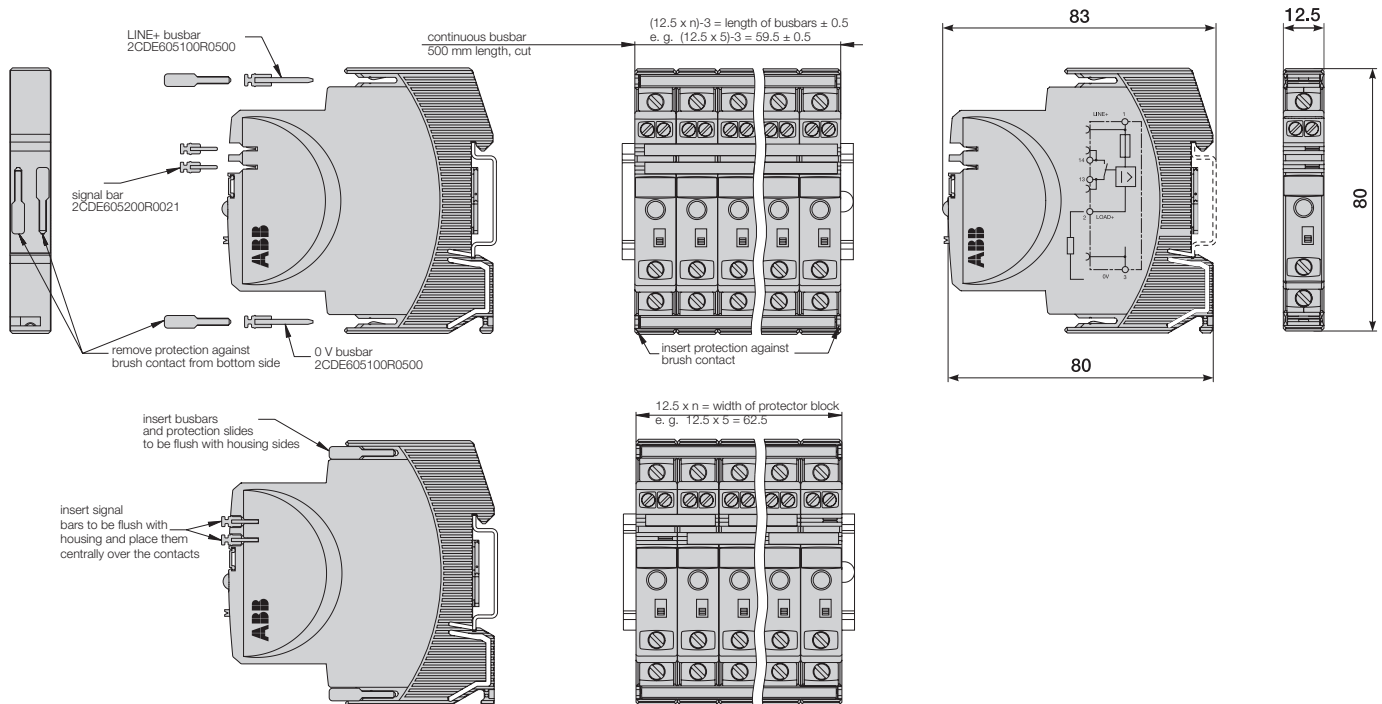
## Electronic protection devices EPD24

### Installation guidelines

The EPD24 features an integral power distribution system.

The following wiring modes are possible with various pluggable current and signal busbars:

- LINE+ (24 V DC)
- 0 V
- Caution: The electronic devices EPD24 require a 0 V connection
- Auxiliary contacts



#### Mounting procedure

Before wiring insert busbars into protector block. A maximum of 10 connection cycles are permissible using connecting busbars.

#### Recommendation

After 10 units the busbars should be interrupted and receive a new entry live.

#### Table of length for busbars

(Order code 2CDE605100R0500)

| No. of units                       | 2  | 3    | 4  | 5    | 6  | 7    | 8  | 9     | 10  |
|------------------------------------|----|------|----|------|----|------|----|-------|-----|
| Length of busbar (mm) $\pm 0.5$ mm | 22 | 34.5 | 47 | 59.5 | 72 | 84.5 | 97 | 109.5 | 122 |

