

CATALOG

Primary switch mode power supplies

CP-D, CP-E, CP-T, CP-C.1



- From economic to high-end
- A reliable solution for every application
- Worldwide approvals and support

Available in four different ranges to cover every application requirement, CP range power supplies are used to empower your valued assets worldwide. Their excellent reliability in daily use has under the toughest of conditions and harshest of environments is proven.

Choose ABB as your power supply partner and leverage our wide variety of product options. From economic to high-end solutions, the CP range offers maximum value.

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.

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.

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



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

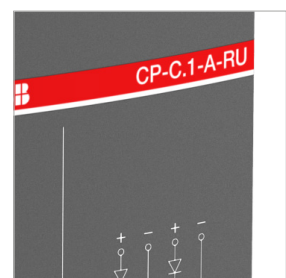
Optimized for worldwide applications: The CP-E power supplies can be supplied with a wide range of AC or DC voltages.

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

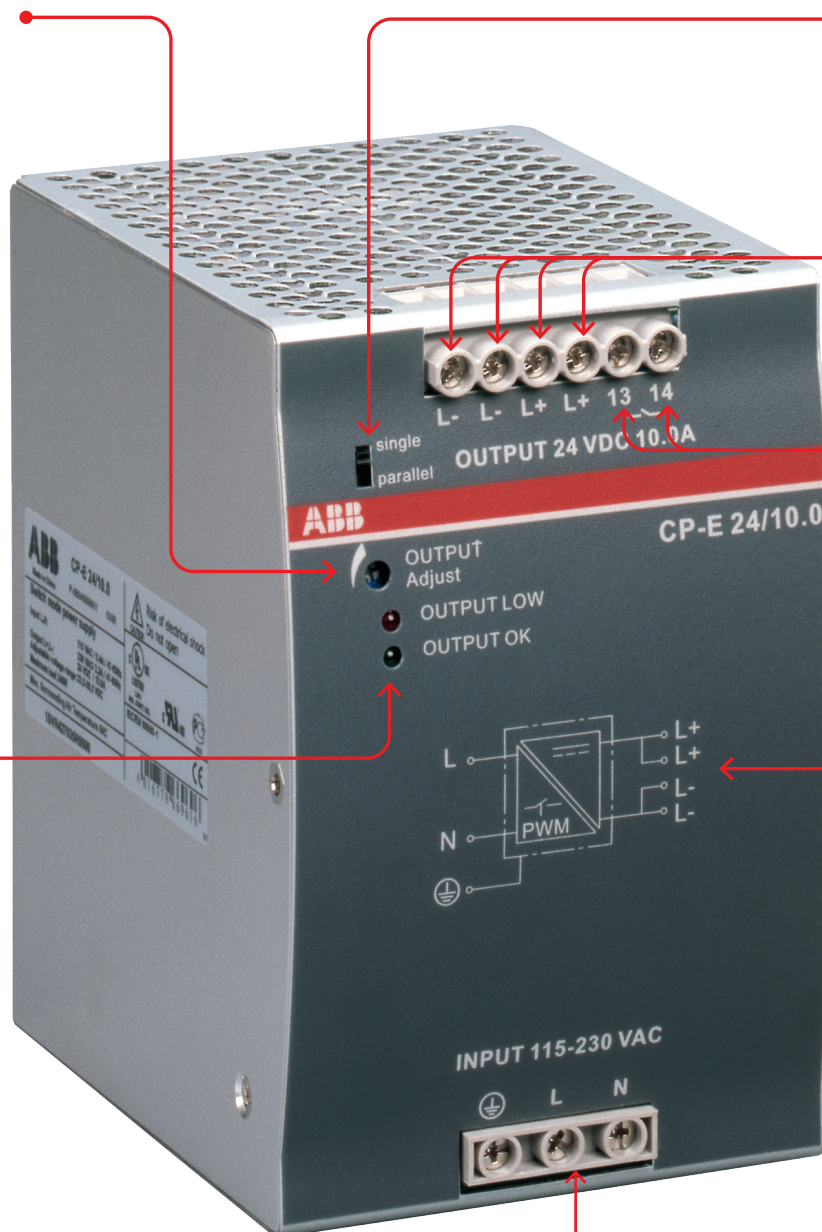
OUTPUT
L+, L+, L-, L-:
Terminals - output
5 V / 12 V / 24 V /
48 V

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



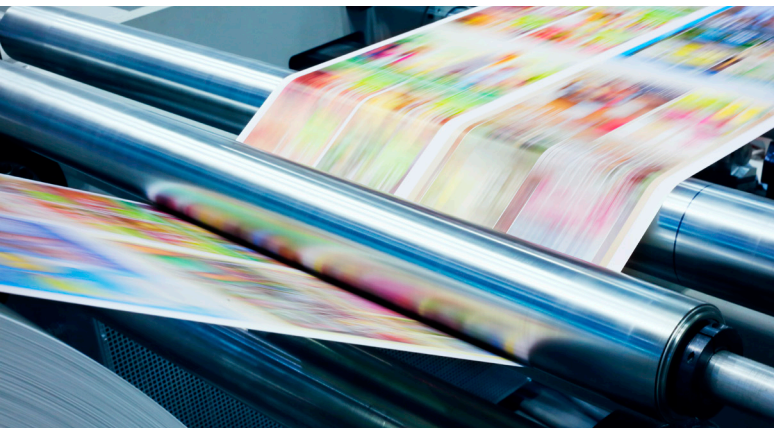
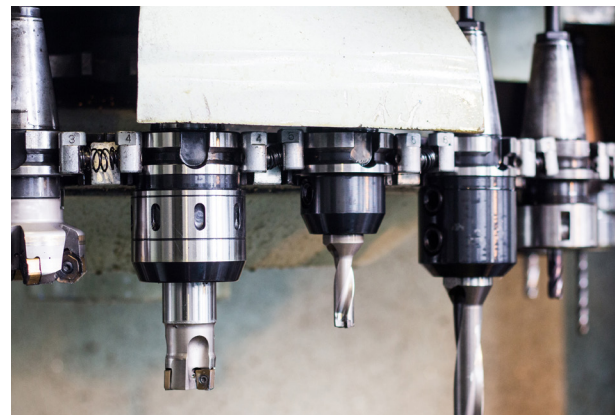
Textile
industry



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.) kg (lb)
90-264 V AC / 120-375 V DC	5 V DC / 3 A	CP-E 5/3.0	1SVR427033R3000	0.15 (0.33)
85-264 V AC / 90-375 V DC	12 V DC / 2.5 A	CP-E 12/2.5	1SVR427032R1000	0.29 (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 (2.20)
90-264 V AC / 120-375 V DC	24 V DC / 0.75 A	CP-E 24/0.75	1SVR427030R0000	0.15 (0.33)
85-264 V AC / 90-375 V DC	24 V DC / 1.25 A	CP-E 24/1.25	1SVR427031R0000	0.29 (0.64)
85-264 V AC / 90-375 V DC	24 V DC / 2.5 A	CP-E 24/2.5	1SVR427032R0000	0.36 (0.79)

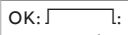
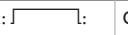
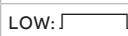
Ordering details - CP-E ≥ 120 W

Input voltage range	Rated output voltage / current	Type	Order code	Weight (1 pc.) 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 (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 (3.01)
90-264 V AC / 120-375 V DC	24 V DC / 20 A	CP-E 24/20.0	1SVR427036R0000	1.90 (4.18)
85-264 V AC / 90-375 V DC	48 V DC / 0.625 A	CP-E 48/0.62	1SVR427030R2000	0.29 (0.64)
85-264 V AC / 90-375 V DC	48 V DC / 1.25 A	CP-E 48/1.25	1SVR427031R2000	0.36 (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 (3.01)
90-264 V AC / 120-375 V DC	48 V DC / 10 A	CP-E 48/10.0	1SVR427035R2000	1.90 (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 _{in}		100-240 V AC		115 / 230 V AC auto select
Input voltage range		90-264 V AC / 120-375 V DC	85-264 V AC / 90-375 V DC	90-132 V AC, 180-264 V AC / 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 / 250 V AC
Power factor correction (PFC)		no		yes, passive, 0.7
Indication of operational states				
Output voltage	green LED	OK:  : output voltage OK	OUTPUT OK:  : output voltage OK	OUTPUT OK:  : output voltage OK
	red LED	LOW:  : output voltage too low	-	OUTPUT LOW:  : 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 _r	T _a ≤ 60 °C	3.0 A	2.5 A	10 A
	60 °C < T _a ≤ 70 °C	2.5 %/°C	2.5 %/°C	
Maximum deviation with	load change statical	±2 %	±0.5 %	±1 % (single mode) ±5 % (parallel mode)
	change of output voltage within the input voltage range	±1 %	±0.5 %	±0.5 %
Recovery time T _R		< 2 ms		
Starting time after applying the supply voltage	at I _r	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		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. 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 _i	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	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 _{in}		100-240 V AC		
Input voltage range		90-264 V AC / 120-375 V DC	85-264 V AC / 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:  : output voltage OK	OUTPUT OK:  : output voltage OK	
	red LED	LOW:  : 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 _r	T _a ≤ 60 °C	0.75 A	1.25 A	2.5 A
Derating of the output current	60 °C < T _a ≤ 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 within the input voltage range	±1 %	±0.5 %	
Recovery time T _R		< 2 ms		
Starting time after applying the supply voltage	at I _r	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 _i	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 _{in}		115 / 230 V AC auto select		115-230 V AC
Input voltage range		90-132 V AC, 180-264 V AC / 210-375 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	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 / 250 V AC	6.3 A slow-acting / 250 V AC	10 A slow-acting / 250 V AC
Power factor correction (PFC)		yes, passive, 0.7	yes, passive, 0.75	yes, active 115 V AC: 0.99 230 V AC: 0.97
Indication of operational states				
Output voltage	green LED	OUTPUT OK: ☐ : output voltage OK		
	red LED	OUTPUT LOW: ☐ : 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 _r	T _a ≤ 60 °C	5 A	10 A	-
	T _a ≤ 55 °C	-	-	20 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 %/°C		-
	55 °C < T _a ≤ 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 _R		< 2 ms		
Starting time after applying the supply voltage	at I _r	max. 1 s	2.5 s (at -40 °C / 90 V AC starting time >2.5 s has 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 _r - max. 0.9 I _r		
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	
	rated load		-35...+60 °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 _i	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 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
Input circuit				
L, N				
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
	at 230 V AC	min. 30 ms		min. 25 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 115 V AC: 0.99 230 V AC: 0.97
Indication of operational states				
Output voltage	green LED	OUTPUT OK:  : output voltage OK		
	red LED	-	-	OUTPUT LOW:  : output voltage too low
Output circuit				
L+, L+, L-, L-				
Rated output voltage	48 V DC			
Tolerance of the output voltage	0...+1 %			
Adjustment range of the output voltage	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 statcal	$\pm 0.5\%$		$\pm 1\%$ (single mode) $\pm 5\%$ (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 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		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 _i	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

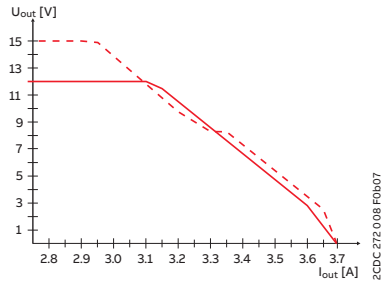
Data at $T_a = 25\text{ }^{\circ}\text{C}$, $U_{in} = 230\text{ V AC}$ and rated values, unless otherwise indicated

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	

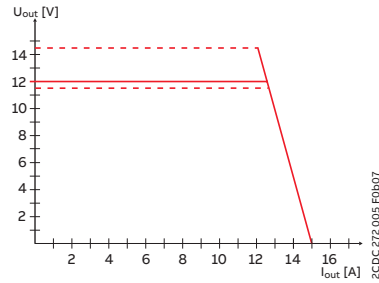
CP-E range

Technical diagrams

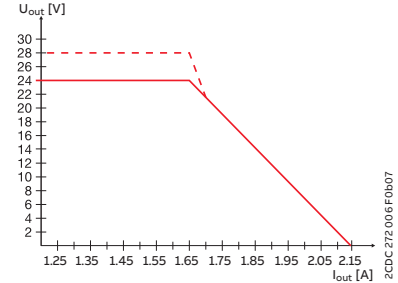
Output curve at $T_a = 25^\circ\text{C}$



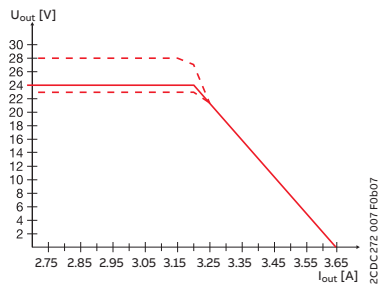
CP-E 12/2.5



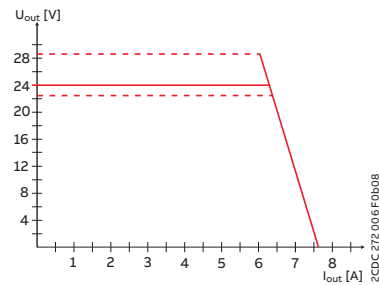
CP-E 12/10.0



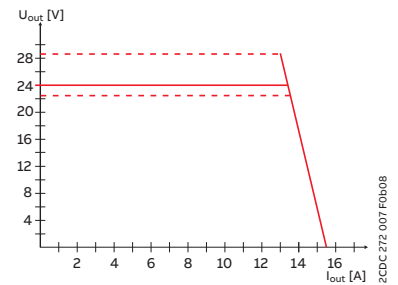
CP-E 24/1.25



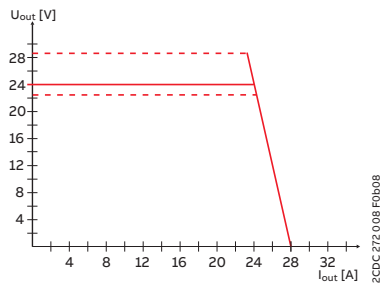
CP-E 24/2.5



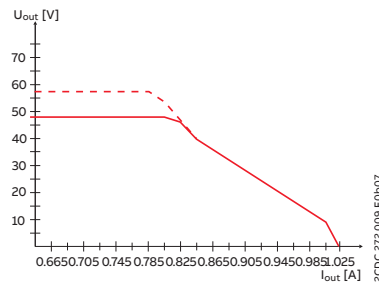
CP-E 24/5.0



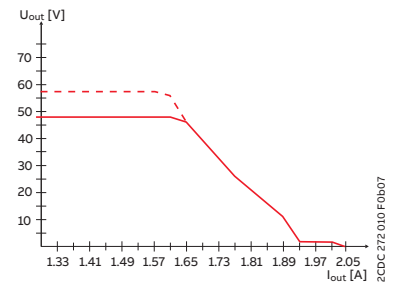
CP-E 24/10.0



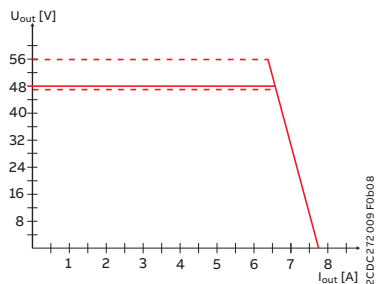
CP-E 24/20.0



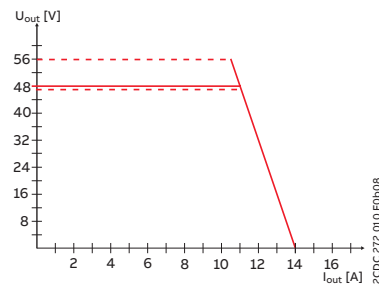
CP-E 48/0.62



CP-E 48/1.25



CP-E 48/5.0

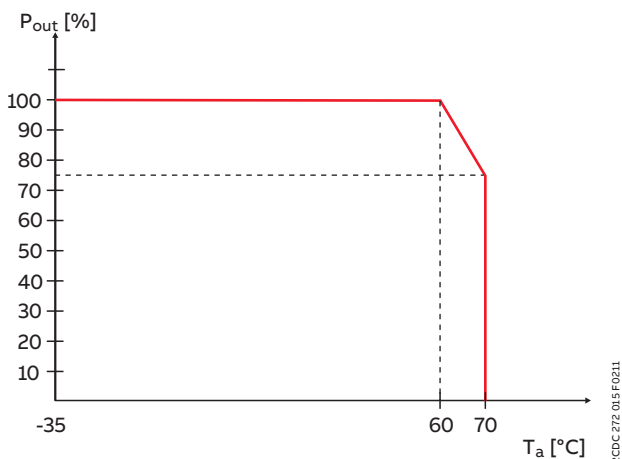


CP-E 48/10.0

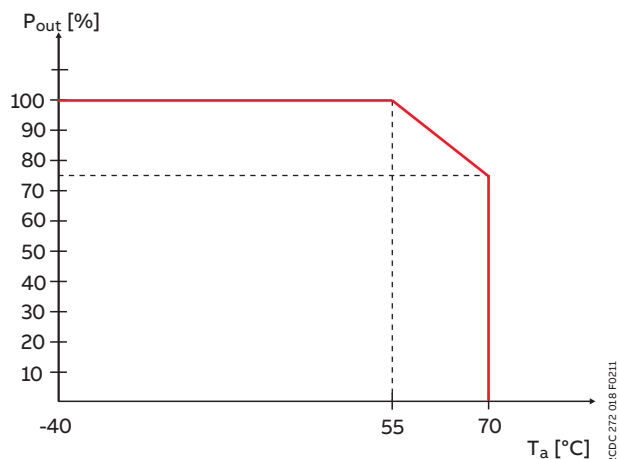
CP-E range

Technical diagrams

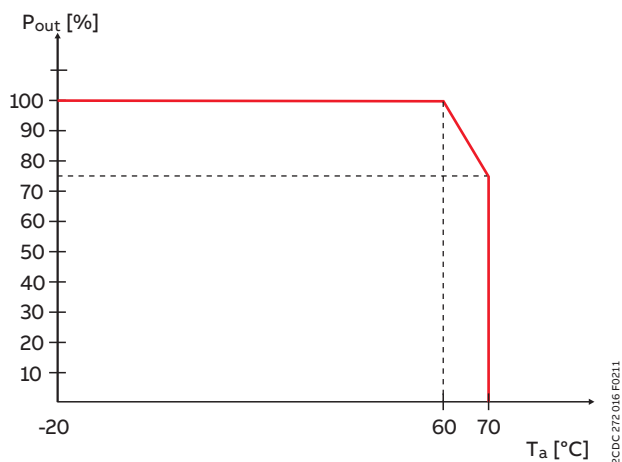
Temperature behavior at $T_a = 25^\circ\text{C}$



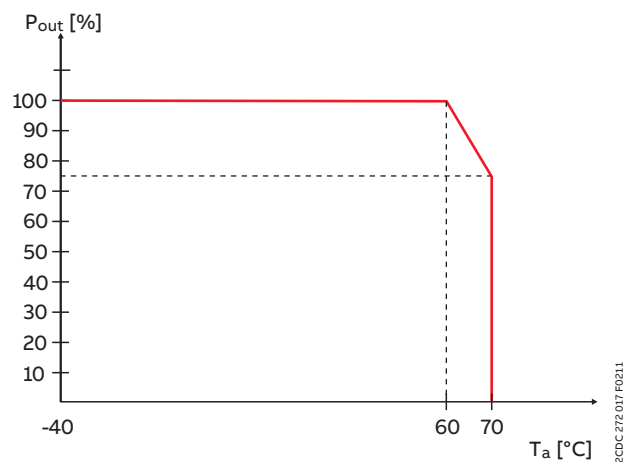
CP-E 12/10.0, CP-E 24/5.0



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



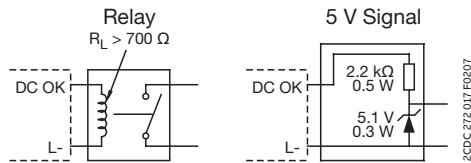
CP-E 5/3.0, CP-E 24/0.75

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

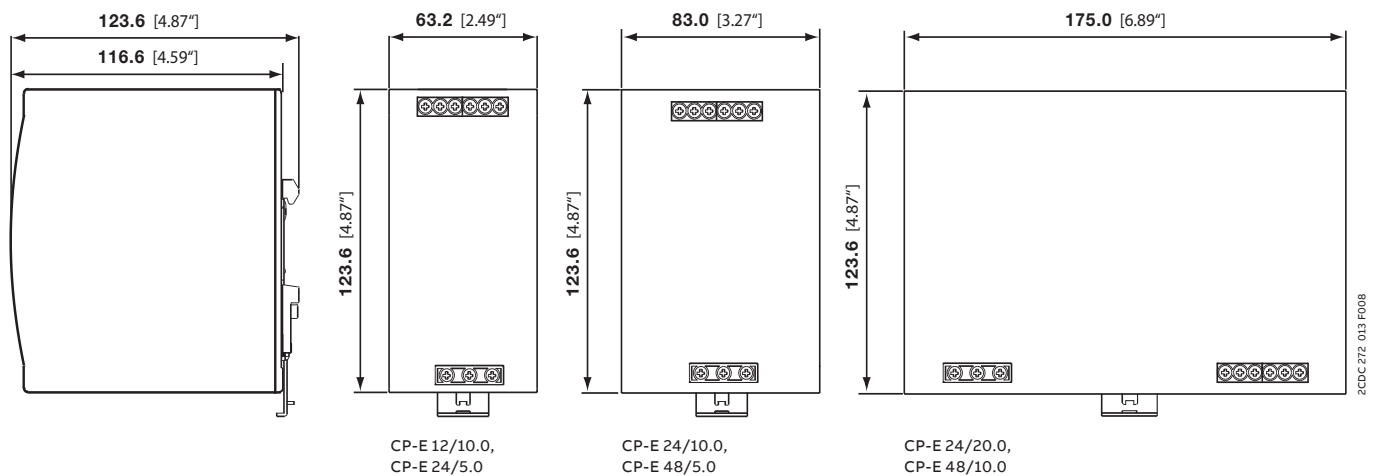
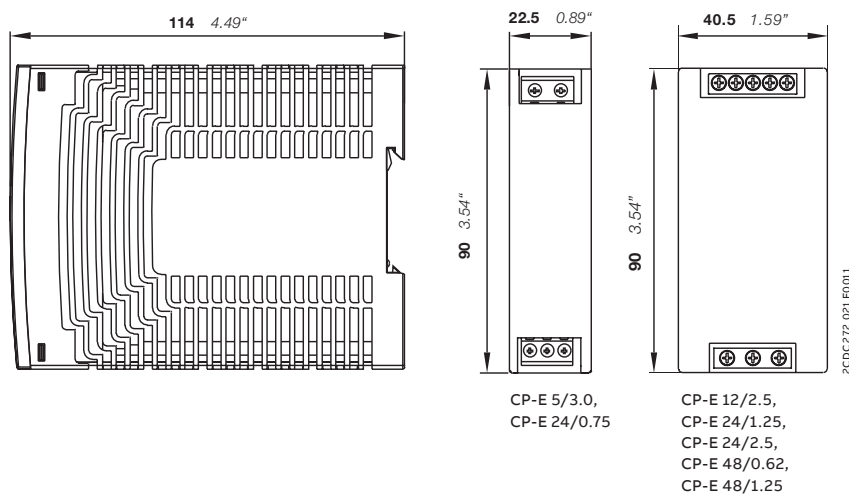
Wiring instructions



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

Dimensional drawings

Dimensions in **mm** and **inches**





CP-T range

Table of contents

32	Benefits and advantages
34	Operating controls
35	Applications
36	Ordering details
37	Technical data
41	Technical diagrams

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 ¹⁾
- 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

¹⁾ 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

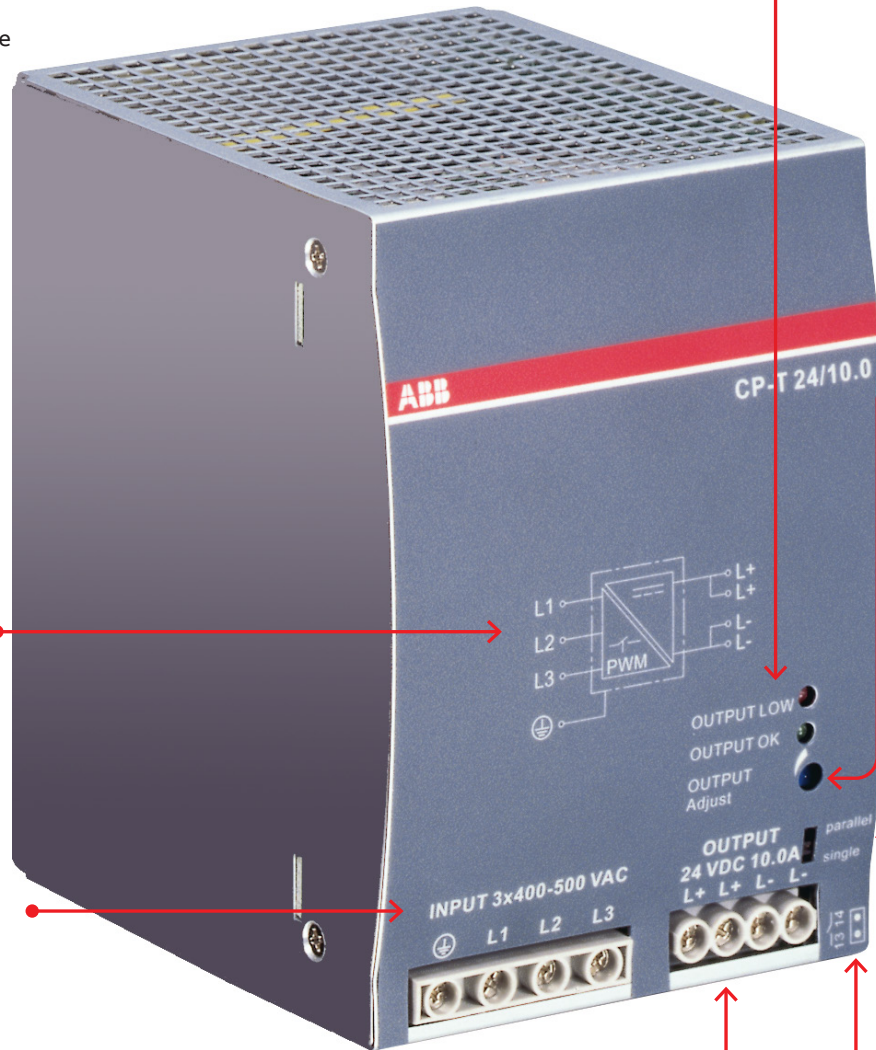
Operating controls

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**

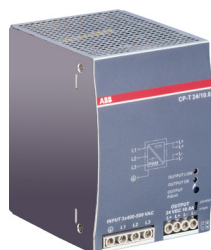
CP-T range

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 $T_a = 25\text{ }^{\circ}\text{C}$, $U_{in} = 3 \times 400\text{ V AC}$ 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 _{in}	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 _r	T _a ≤ 60 °C	5 A	10 A	20 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 %/°C		3.5 %/°C
Signalling contact	13-14	solid-state (max. 60 V DC, 0.3 A)		
for output voltage OK	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 _a	at nominal load	< 2 ms		
Starting time after applying the supply voltage	at I _r	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 _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		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 _i	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 $T_a = 25\text{ °C}$, $U_{in} = 3 \times 400\text{ V AC}$ 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 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 ≤ 60 °C	5 A	10 A	20 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 %/°C		3.5 %/°C
Maximum deviation with	load change statical	±1 % (single mode) ± 5 % (parallel mode)		
	change of output voltage within the input voltage range	±0.5 %		
Recovery time T _A	at rated load	< 2 ms		
Starting time after applying the supply voltage	at I _r	max. 1 s		
	with 7000 µF	max. 1.5 s		
Rise time	at rated load	max. 150 ms		
	with 7000 µF	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 µF		

CP-T range

Technical data

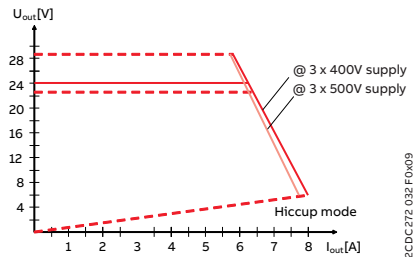
Data at $T_a = 25\text{ °C}$, $U_{in} = 3 \times 400\text{ V AC}$ and rated values, unless otherwise indicated

Type		CP-T 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 _i	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 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		

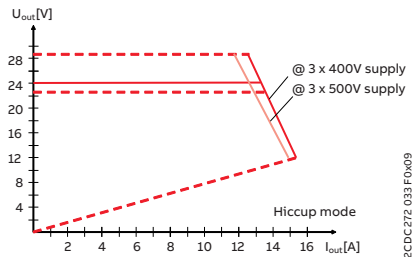
CP-T range

Technical diagrams

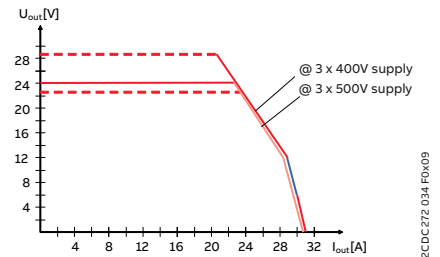
Output curves at $T_a = 25^\circ\text{C}$



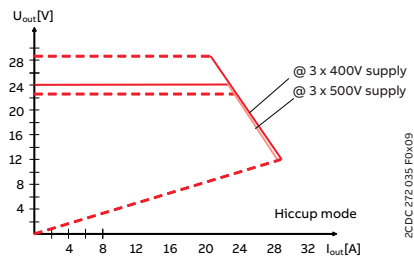
CP-T 24/5.0



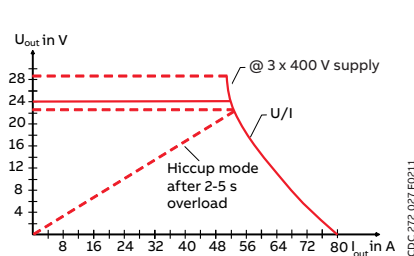
CP-T 24/10.0



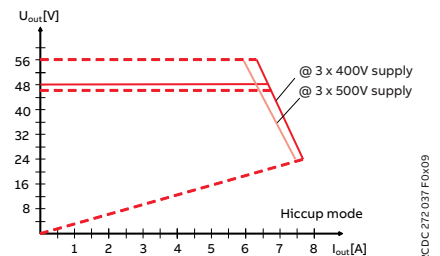
CP-T 24/20.0 U/I curve



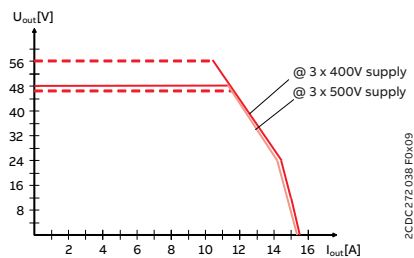
CP-T 24/20.0 Hiccup mode



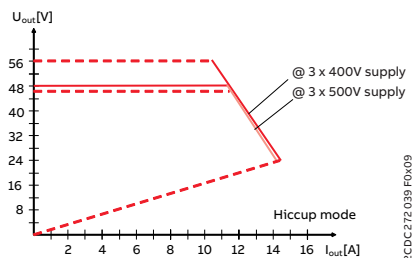
CP-T 24/40.0



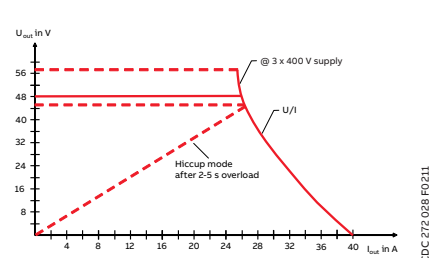
CP-T 48/5.0



CP-T 48/10.0 U/I curve

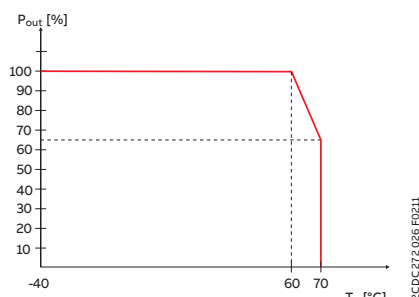


CP-T 48/10.0 Hiccup mode

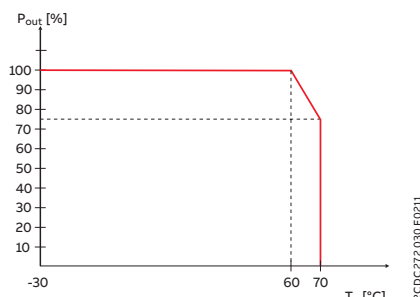


CP-T 48/20.0

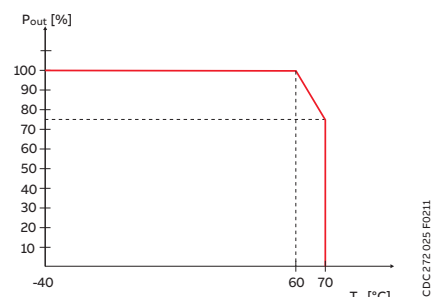
Temperature curves at rated load



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



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



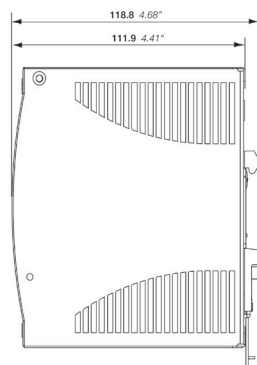
CP-T 24/5.0, CP-T 24/10.0, CP-T 48/5.0

CP-T range

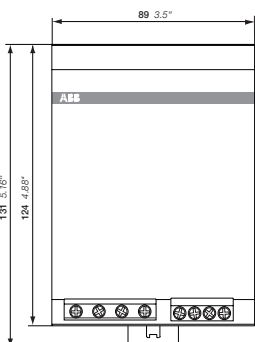
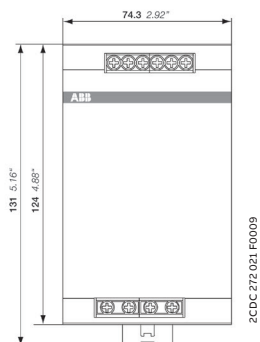
Technical diagrams

Dimensional drawings

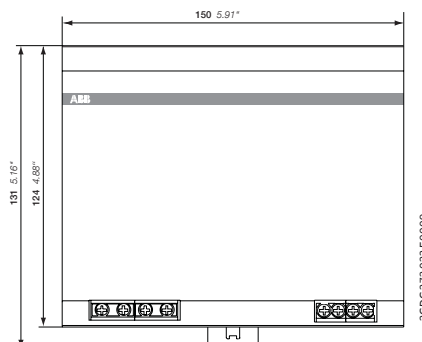
Dimensions in **mm** and inches



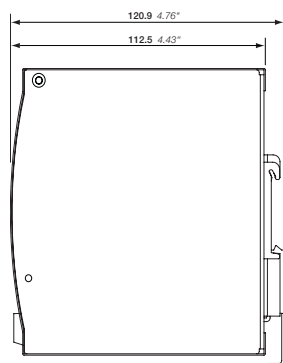
CP-T 24/5.0



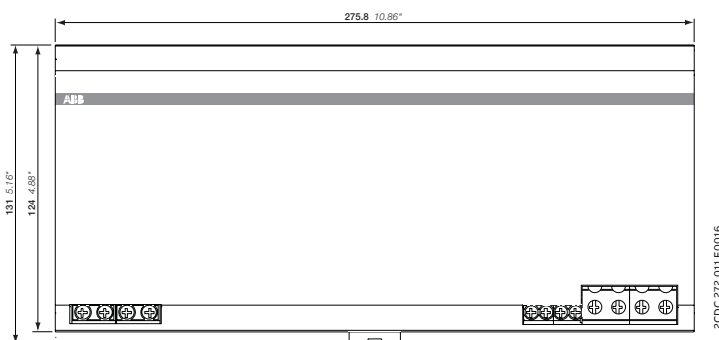
CP-T 24/10.0, CP-T 48/5.0



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



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





CP-C.1 range

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63	Technical diagrams

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.



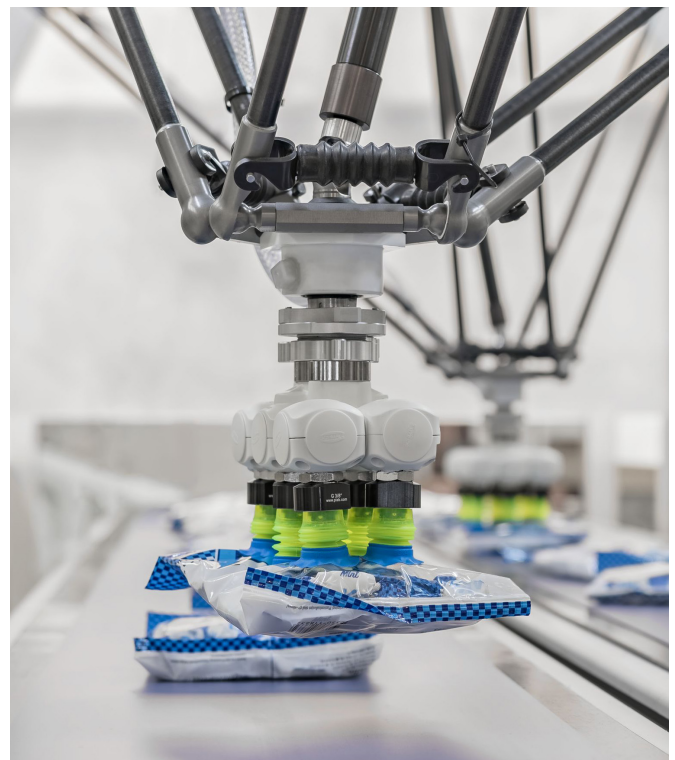
Signaling output

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	dark grey	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 _{in}		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 ² 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 _{out}
		flashing	90 % adjusted U _{out}
Power reserve	LED 'I > I _R ' (yellow)	OFF	I ≤ I _R
		ON	I > I _R
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 _R	- 25 °C ≤ T _a ≤ 60 °C	5.0 A	-
	- 40 °C ≤ T _a ≤ 60 °C	-	5.0 A
Reserve output current	- 25 °C ≤ T _a ≤ 40 °C	7.5 A continuously	-
	- 40 °C ≤ T _a ≤ 40 °C	-	7.5 A continuously
Short-circuit current limiting		7.6 A	
Derating of the output current		60 °C < T _a ≤ 70 °C 2.5 %/°C	
Deviation width of output voltage	static output voltage deviaton 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 _A		< 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 _{pp} , 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 _{out}	
OFF (contact open)		90 % adjusted U _{out}	
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 _R	transistor, short-circuit proof	
Active / ON (closed)		I > I _R	
Inactive / OFF (open)		I ≤ I _R	
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 ² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm ² (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 ² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm ² (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; 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 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H2S ≥ 100 ± 10 ppb - SO2/SO3 ≥ 300 ± 20 ppb - Cl2 ≥ 100 ± 10 ppb - NOx ≥ 1250 ± 20 ppb
Isolation data			
Rated impulse withstand voltage U _{imp} (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 _i (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: 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) 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 _{in}	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 ² 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 _{out}
		flashing	90 % adjusted U _{out}
Power reserve	LED 'I > I _R ' (yellow)	OFF	I ≤ I _R
		ON	I > I _R
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 _R	- 25 °C ≤ T _a ≤ 60 °C	10.0 A	-
	- 40 °C ≤ T _a ≤ 60 °C	-	10.0 A
Reserve output current	- 25 °C ≤ T _a ≤ 40 °C	15.0 A continuously	-
	- 40 °C ≤ T _a ≤ 60 °C	-	15.0 A continuously
Short-circuit current limiting		15.5 A	15.5 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 %/°C	2.5 %/°C
Deviation width of output voltage	static output voltage deviation 25-100 %	< 1%, class C	
		< 5 %, class B	
	change of input voltage within the rated input voltage	< 1 ms, class A	
Recovery time T _A		< 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 _{pp} , 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 _{out}	
OFF (contact open)		90 % adjusted U _{out}	
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 _R	transistor, short-circuit proof	
Active / ON (closed)		I > I _R	
Inactive / OFF (open)		I ≤ I _R	
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 mm ² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm ² (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 ² (20-10 AWG)	
	fine-strand with(out) wire end ferrule	0.5-2.5 mm ² (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 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 _R)		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 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H2S ≥ 100 ± 10 ppb - SO2/SO3 ≥ 300 ± 20 ppb - Cl2 ≥ 100 ± 10 ppb - NOx ≥ 1250 ± 20 ppb
Isolation data			
Rated impulse withstand voltage U _{imp} (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 _i (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: 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) 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 24/20.0, CP-C.1 24/20.0-L		CP-C.1 24/20.0-C
Input circuit - Supply circuit			
		L (+), N (-)	
Rated input voltage U _{in}		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 _{out}
		flashing	90 % adjusted U _{out}
Power reserve	LED ‘I > I _R ‘ (yellow)	OFF	I ≤ I _R
		ON	I > I _R
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 _R		- 25 °C ≤ T _a ≤ 60 °C	20 A
		- 40 °C ≤ T _a ≤ 60 °C	-
Reserve output current		- 25 °C ≤ T _a ≤ 40 °C	26.0 A continuously
		- 40 °C ≤ T _a ≤ 60 °C	-
Short-circuit current limiting		27.7 A	
Derating of the output current		60 °C < T _a ≤ 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 _A		< 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 _{pp} , 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 _{out}	
OFF (contact open)		90 % adjusted U _{out}	
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 _R	transistor, short-circuit proof	
Active / ON (closed)		I > I _R	
Inactive / OFF (open)		I ≤ I _R	
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 _R)		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 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H2S ≥ 100 ± 10 ppb - SO2/SO3 ≥ 300 ± 20 ppb - Cl2 ≥ 100 ± 10 ppb - NOx ≥ 1250 ± 20 ppb

CP-C.1 range

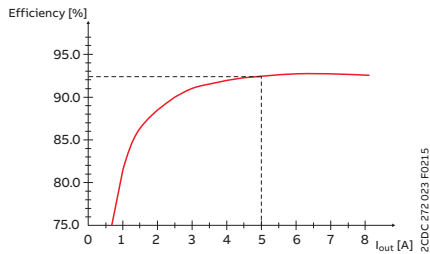
Technical data

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 _{imp} (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 _i (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: 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) 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	

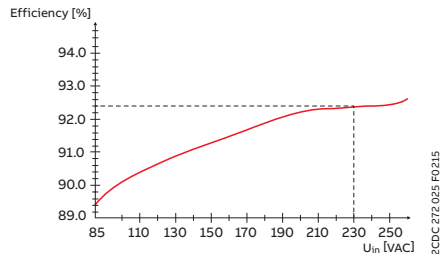
CP-C.1 range

Technical diagrams

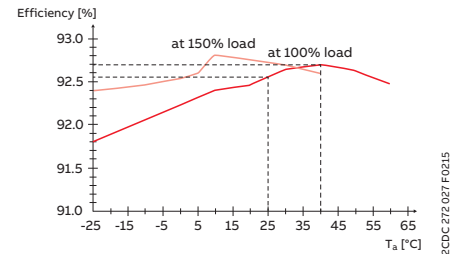
CP-C.1 24/5.0, CP-C.1 24/5.0-L and CP-C.1 24/5.0-C



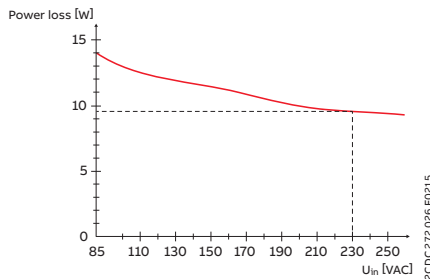
Typical efficiency over output current



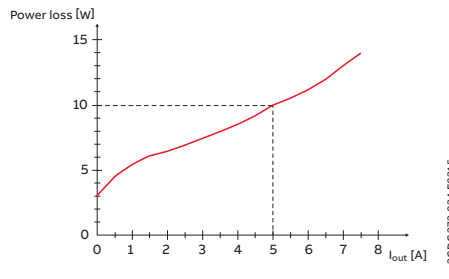
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature

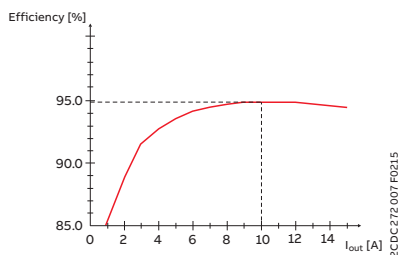


Typical power loss over AC input voltage

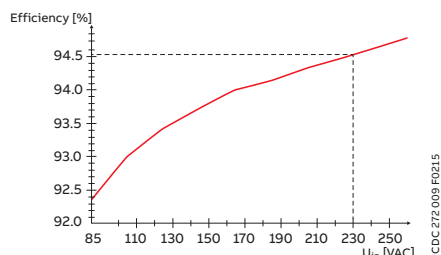


Typical power loss over output current

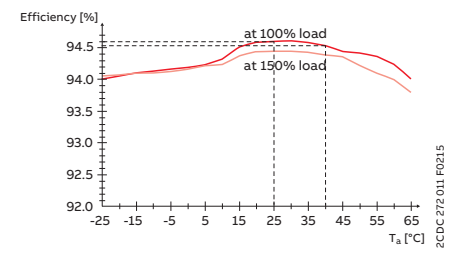
CP-C.1 24/10.0, CP-C.1 24/10.0 -L and CP-C.1 24/10.0-C



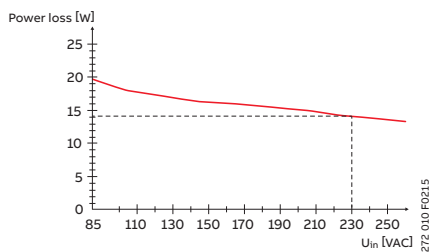
Typical efficiency over output current



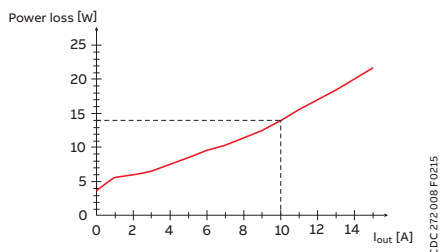
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



Typical power loss over AC input voltage

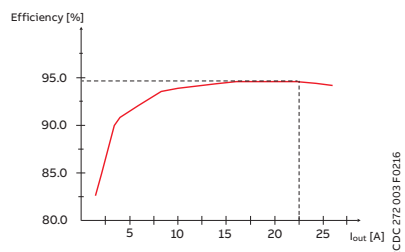


Typical power loss over output current

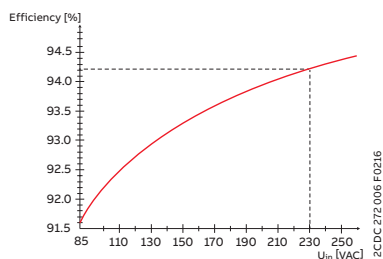
CP-C.1 range

Technical diagrams

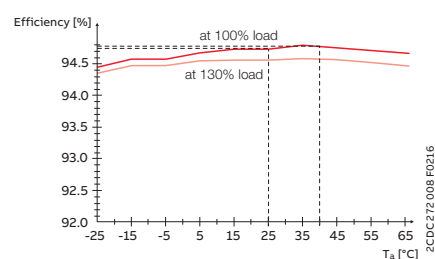
CP-C.1 24/20.0, CP-C.1 24/20.0-L and CP-C.1 24/20.0-C



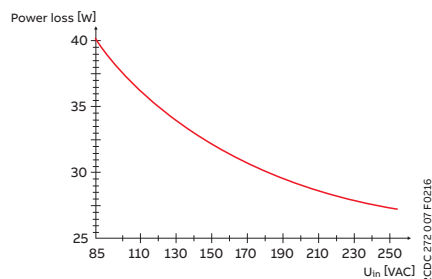
Typical efficiency over output current



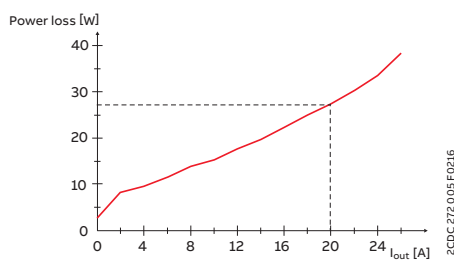
Typical efficiency over AC input voltage



Typical efficiency over ambient temperature



Typical power loss over AC input voltage

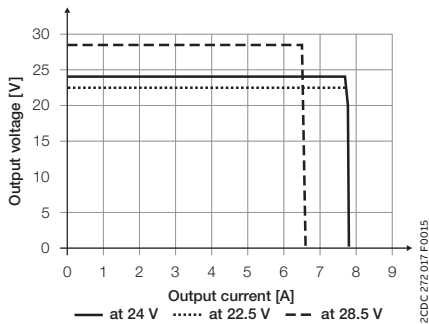


Typical power loss over output current

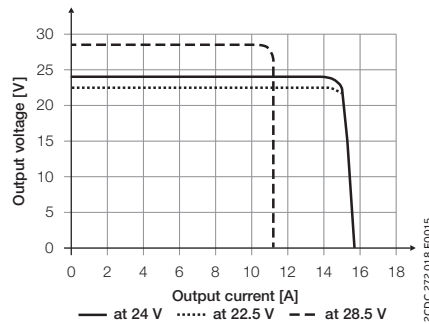
CP-C.1 range

Technical diagrams

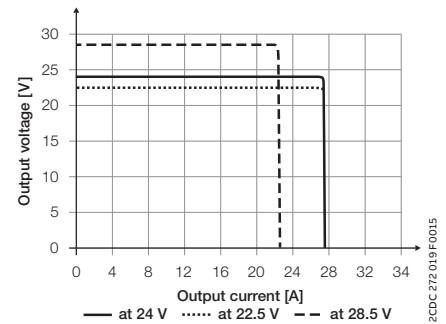
Characteristic curve of output at $T_a = 25^\circ\text{C}$



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

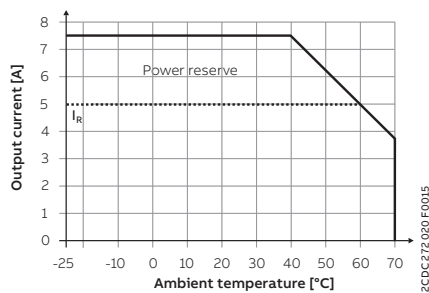


CP-C.1 24/10.0, CP-C.1 24/10.0-L
CP-C.1 24/10.0-C

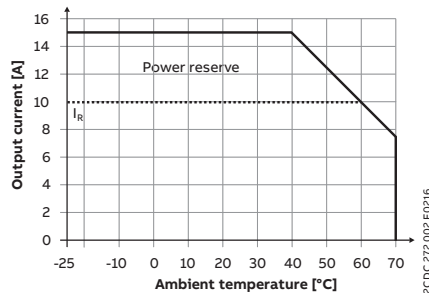


CP-C.1 24/20.0, CP-C.1 24/20.0-L
CP-C.1 24/20.0-C

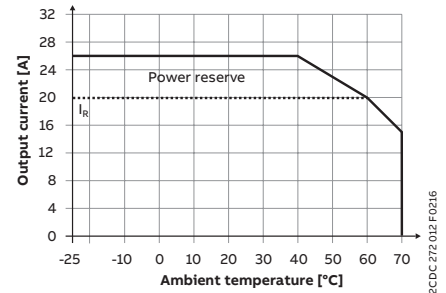
Characteristic curve of temperature at $U_{out} = 24\text{ V}$



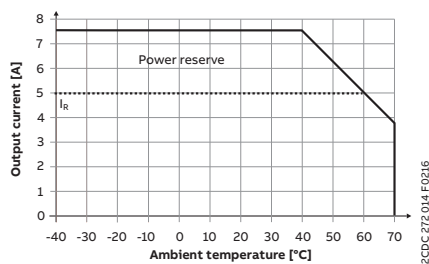
CP-C.1 24/5.0, CP-C.1 24/5.0-L



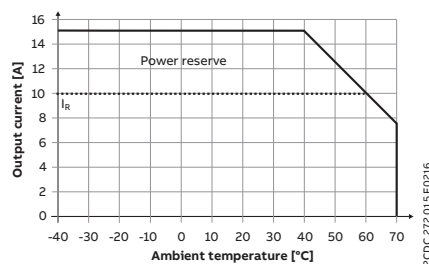
CP-C.1 24/10.0, CP-C.1 24/10.0-L



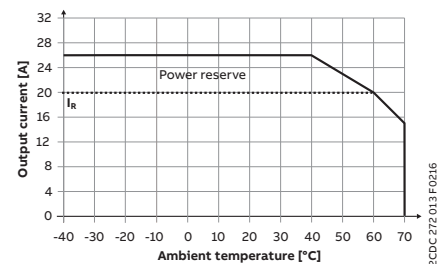
CP-C.1 24/20.0, CP-C.1 24/20.0-L



CP-C.1 24/5.0-C



CP-C.1 24/10.0-C



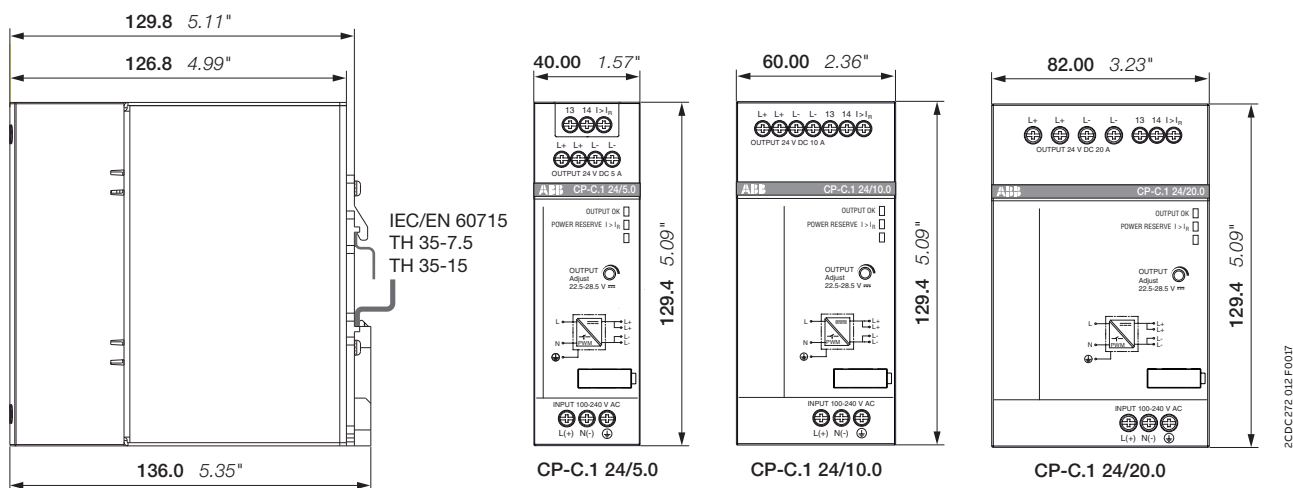
CP-C.1 24/20.0-C

CP-C.1 range

Technical diagrams

Dimensional drawings

Dimensions in **mm** and inches





Power supplies for building applications

Table of contents

70	CP-D range
70	Benefits and advantages
72	Operation controls
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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

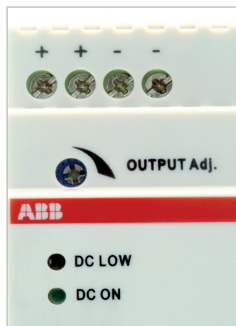
The CP-D range types > 10 W feature a continuously adjustable output voltage. Thus, they can be optimally adapted to the application, for example compensating the voltage drop caused by a long line length.

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.

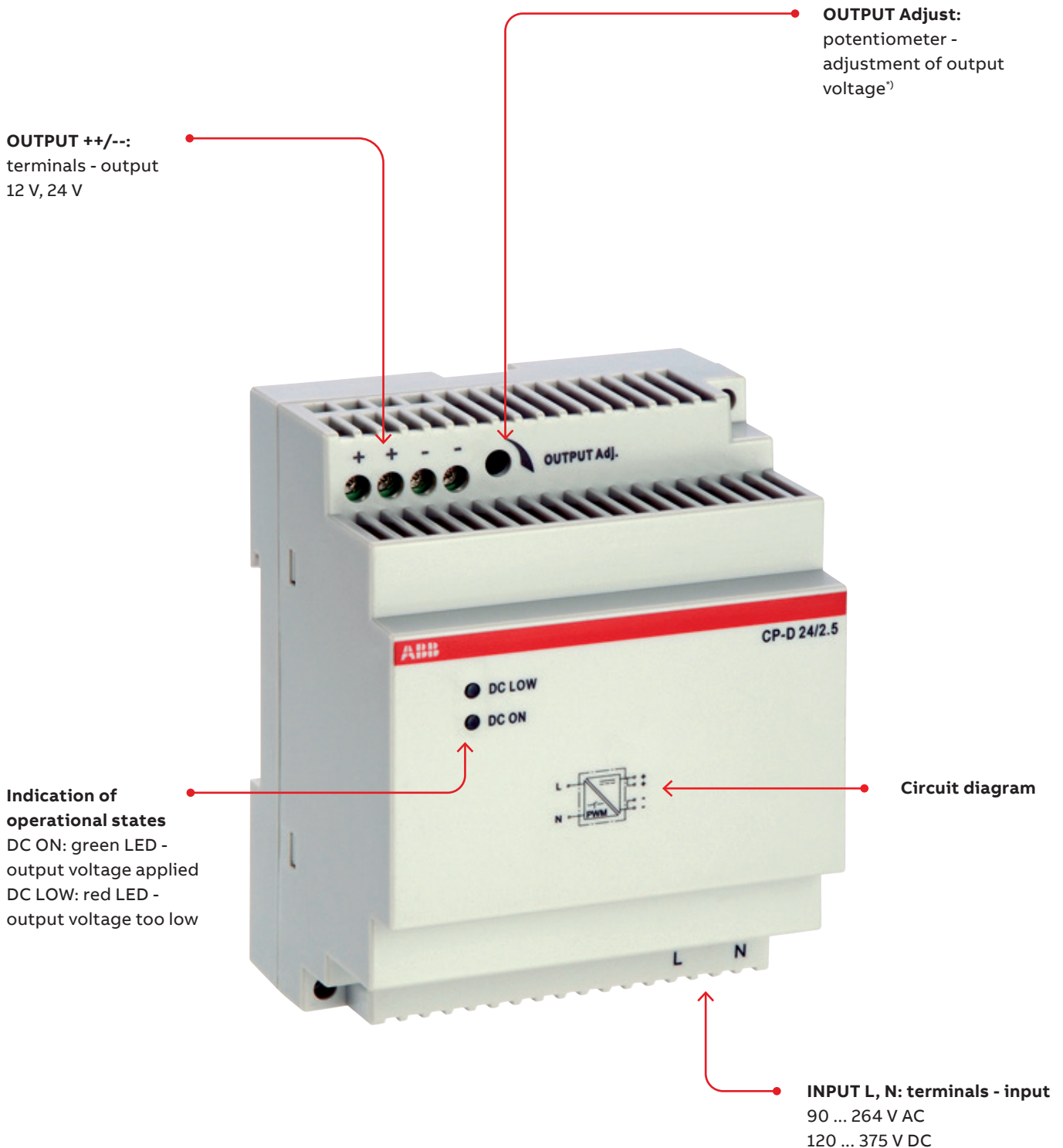
Width and structural form

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



¹⁾ 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



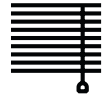
Escalators



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
Input circuit - supply circuit		L, N	
Rated input voltage U _{in}		100-240 V AC	
Input voltage range		90-264 V AC / 120-375 V DC	
Frequency range AC		47-63 Hz	
Typical input current / 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	
Indication of operational states			
Output voltage	DC ON: green LED	 : output voltage applied	
	DC LOW: red LED	 : output voltage too low	
Output circuit		+, -	++, --
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 _r		T _a ≤ 60 °C 0.83 A	2.1 A
Derating of the output current		60 °C < T _a ≤ 70 °C 2.5 %/°C	
Maximum deviation with	load change statical	max. 1 %	
	change of output voltage within the input voltage range	max. 1 %	
Recover time T _A		< 1 ms	
Starting time after applying the supply voltage		at I _r	1000 ms
Rise time		at rated load	typ. 1 ms
Residual ripple and switching peaks		BW = 20 MHz	50 mV
Parallel connection		yes, using CP-D RU	
Series connection		yes, to increase voltage	
Resistance to reverse feed		18 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. 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	
General data			
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 _i	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 $T_a = 25\text{ }^{\circ}\text{C}$, $U_{in} = 230\text{ V AC}$ 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 _{in}				
100-240 V AC				
Input voltage range				
90-264 V AC / 120-375 V DC				
Frequency range AC				
47-63 Hz				
Typical input current / 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 / 250 V AC 2 A slow-acting / 250 V AC 3.15 A slow-acting / 250 V AC				
Power factor correction (PFC)				
no				
Indication of operational states				
Output voltage				
DC ON: green LED				
[]: output voltage applied				
DC LOW: red LED				
[]: 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 _r				
T _a ≤ 60 °C: 0.42 A T _a ≤ 60 °C: 1.3 A T _a ≤ 55 °C: 2.5 A T _a ≤ 60 °C: 4.2 A				
Derating of the output current				
60 °C < T _a ≤ 70 °C: 2.5 %/°C 60 °C < T _a ≤ 70 °C: 2.5 %/°C 55 °C < T _a ≤ 70 °C: 2.5 %/°C 60 °C < T _a ≤ 70 °C: 2.5 %/°C				
Maximum load change statical				
deviation change of output voltage within the input voltage range with				
max. 1 % max. 1 %				
Recover time T _A				
< 1 ms				
Starting time after applying the supply voltage at I _r				
1000 ms				
Rise time at rated load				
typ. 1 ms				
Residual ripple and switching peaks BW = 20 MHz				
50 mV				
Parallel connection				
yes, 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

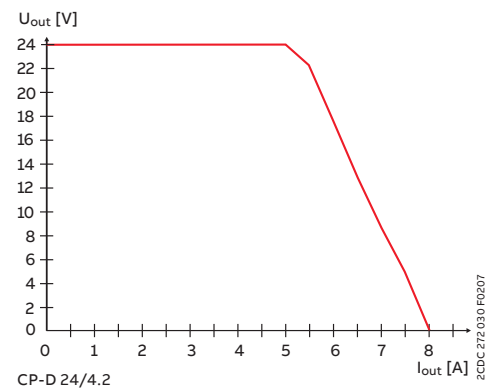
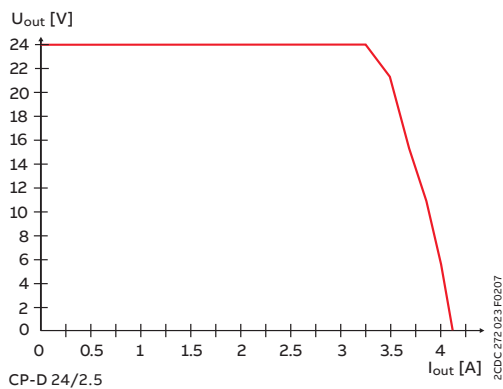
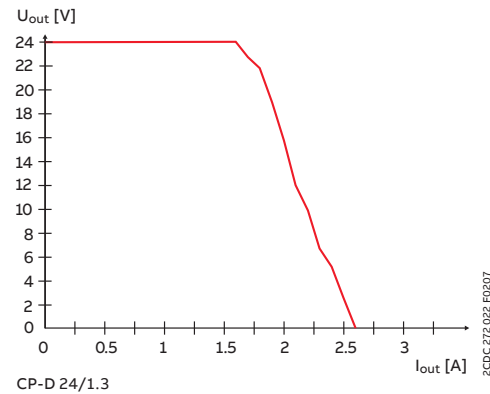
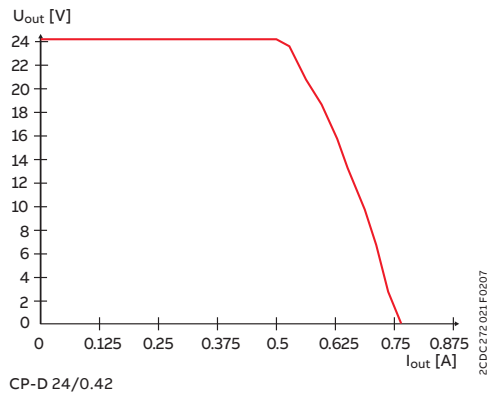
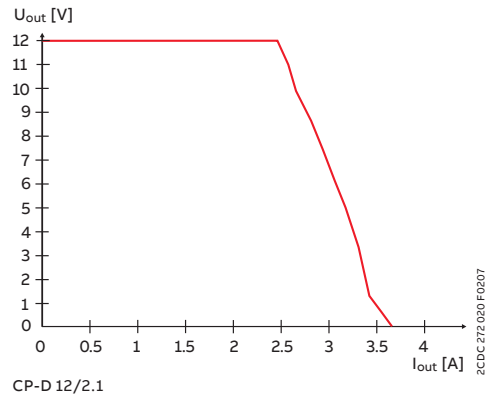
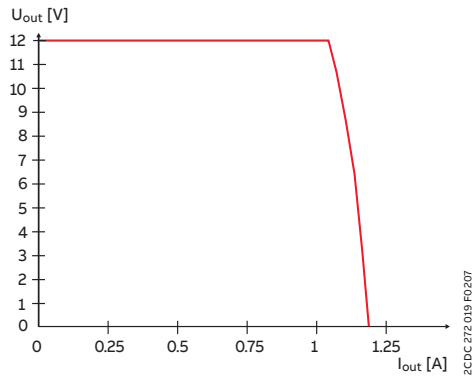
Data at $T_a = 25\text{ °C}$, $U_{in} = 230\text{ V AC}$ and rated values, unless otherwise indicated

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 _i	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			

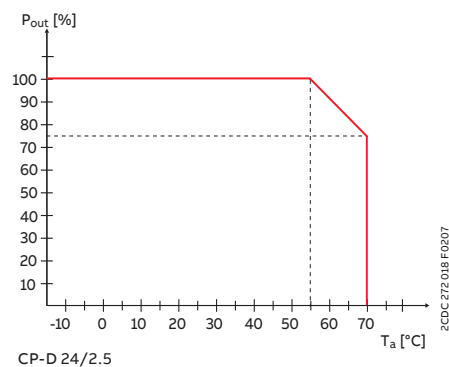
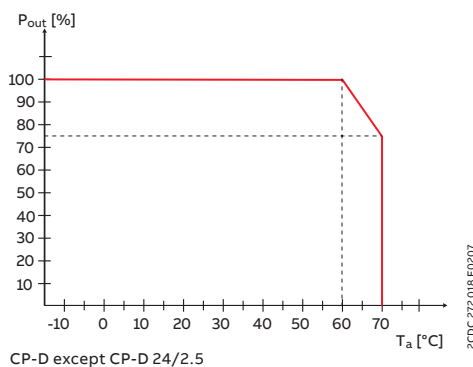
CP-D range

Technical diagrams

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



Characteristic curve of temperature at rated output voltage

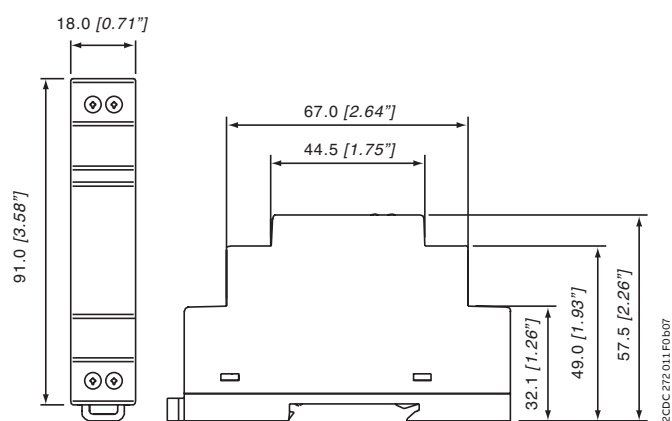


CP-D range

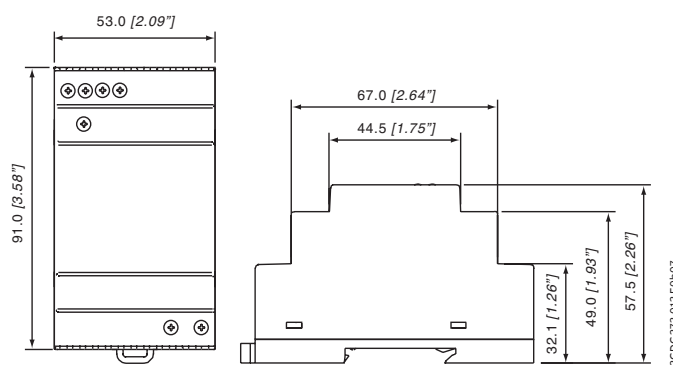
Technical diagrams

Dimensional drawings

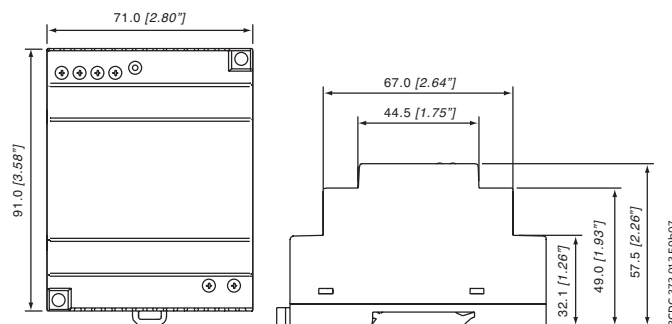
Dimensions in mm and inches



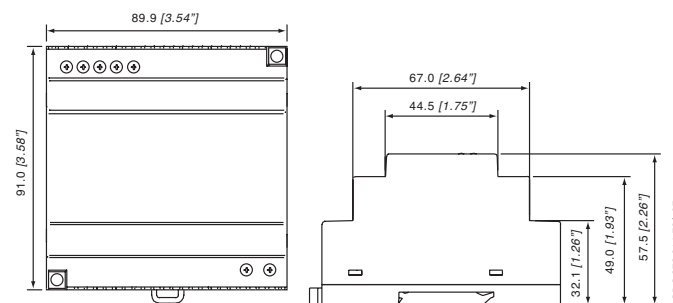
CP-D 12/0.83, CP-D 24/0.42



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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86	Operation controls
87	Applications
88	Ordering details
89	Technical data
92	Technical diagrams

CP-B range

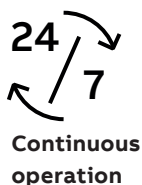
Benefits and advantages



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 kWs¹⁾)
CP-B 24/10.0 (10 A / 10 kWs¹⁾)
CP-B 24/20.0 (20 A / 8 kWs¹⁾)
- CP-B 24/3.0 and CP-B 24/20.0 expandable with additional extension module(s)
CP-B EXT.2 (2 kWs¹⁾)
- 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

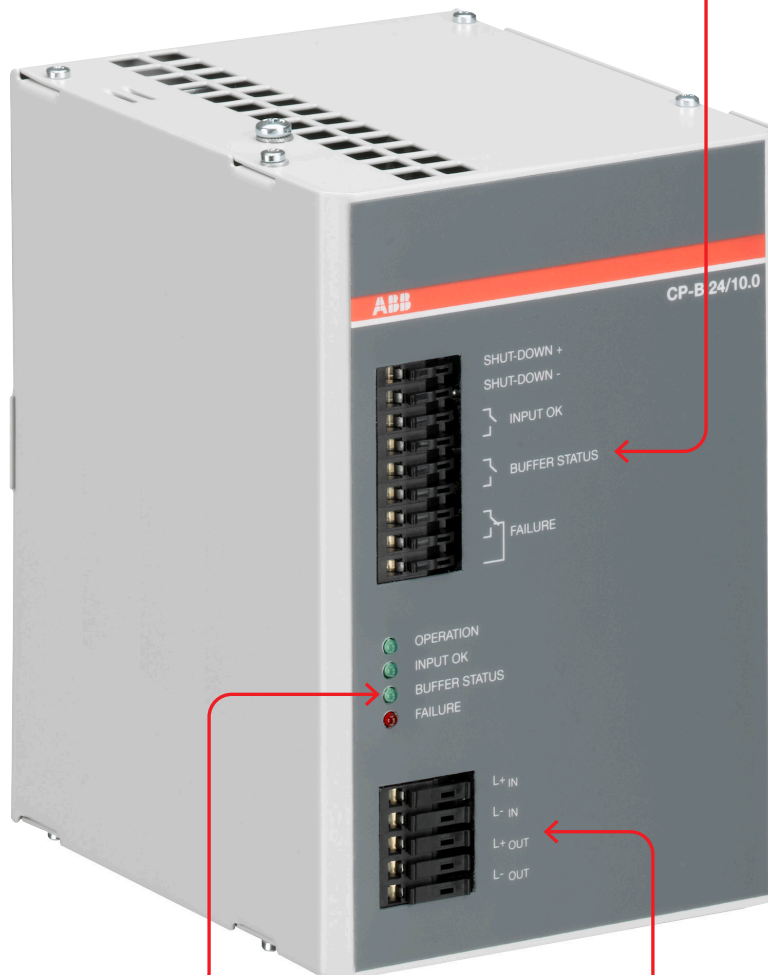
¹⁾ internal energy buffer

		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 ¹⁾ 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	

¹⁾ 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₊ IN, L₋ IN: Input voltage
terminals

Indication of operational states

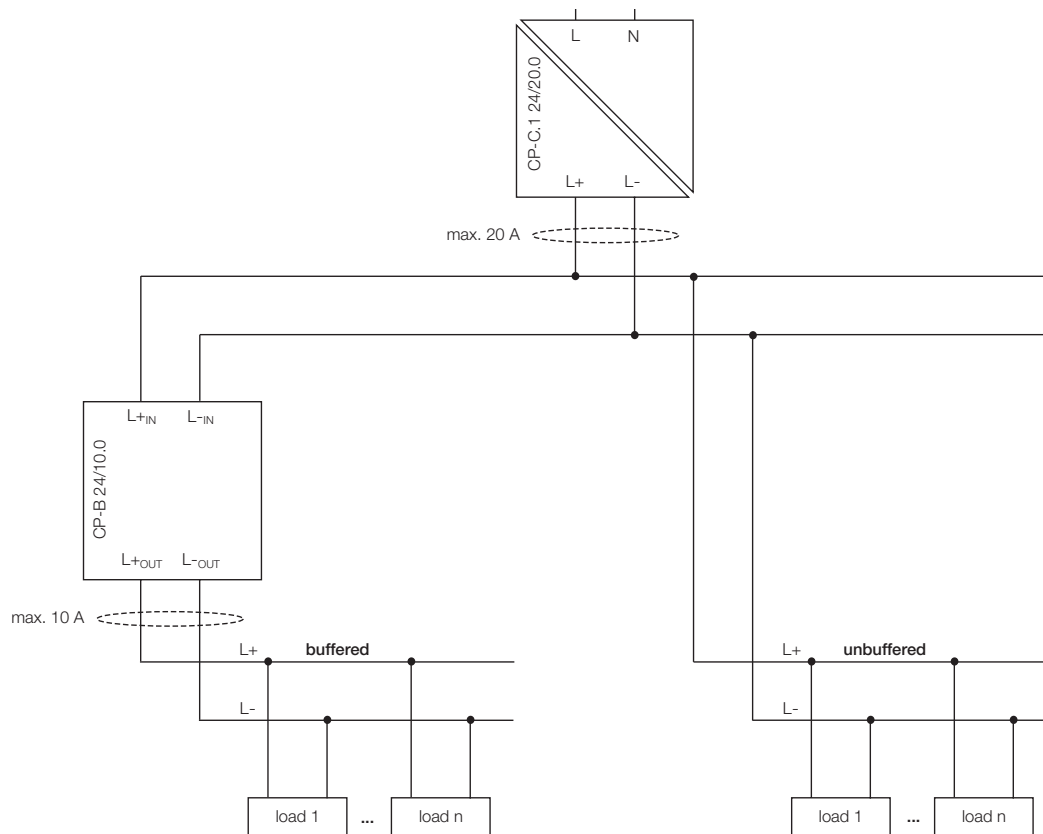
OPERATION:
Buffer module in operation
(standby or buffering)
INPUT OK:
Input voltage applied

Output terminals

L₊ OUT, L₋ OUT, L₋ 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 (1 pc.) 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 (1 pc.) 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
Input circuit - Supply circuit			
	L⁺_{IN} L⁻_{IN}		
Rated input voltage U _{in}	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
	rated voltage	-	24 V DC
	voltage range	-	6-45 V DC
Output circuit			
	L⁺_{OUT} L⁻_{OUT} L⁻_{OUT}		
Rated output power	69 W	240 W	480 W
Rated output voltage U _{out}	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 _r	T _a ≤ 60 °C 3 A DC	10 A DC	20 A DC
Peak output current (fully loaded capacitors required)	T _a ≤ 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 _r	-
Breaking capacity of output circuit	t = 2.5 ms -	24 V DC, 10 A	-
Power failure buffering time ¹⁾	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 ⁶ switching cycles		
Electrical lifetime	0.1 × 10 ⁶ 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 ¹⁾	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 ² (28-18 AWG)	0.08-1.5 mm ² (28-18 AWG)	0.2-4.0 mm ² (24-12 AWG)
	rigid	0.08-1.5 mm ² (28-16 AWG)	0.08-4.0 mm ² (28-16 AWG)	0.2-6.0 mm ² (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 ² (28-18 AWG)		0.14-1.0 mm ² (26-16 AWG)
	rigid	0.08-1.5 mm ² (28-16 AWG)		0.14-1.5 mm ² (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		

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

CP-B range

Technical data

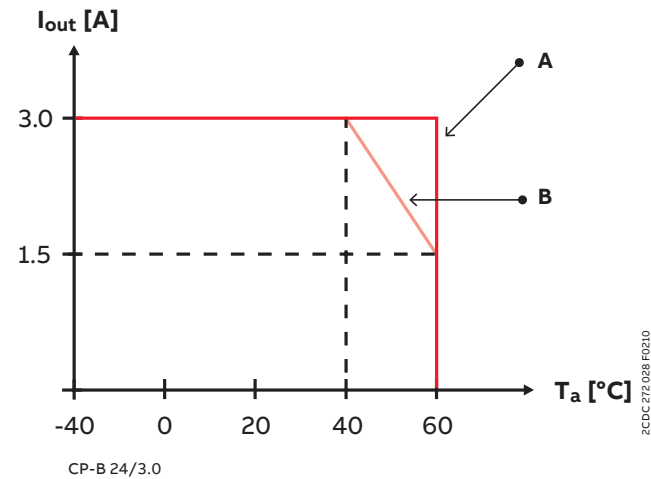
Data at $T_a = 25\text{ °C}$ and rated values, unless otherwise indicated

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

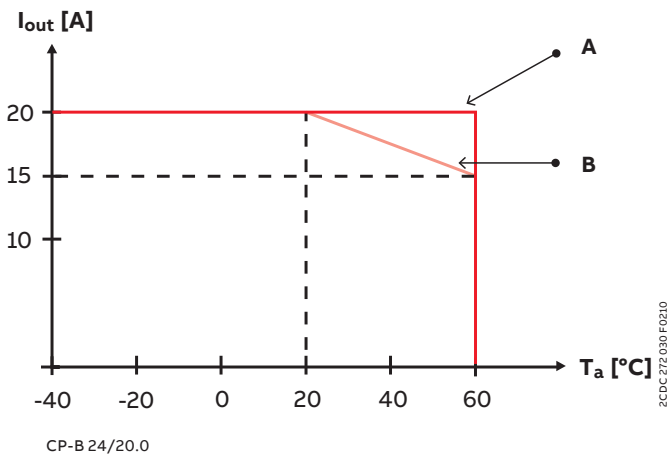
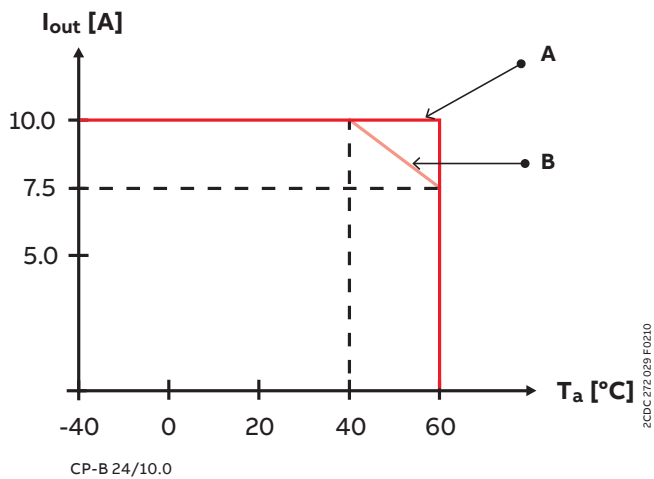
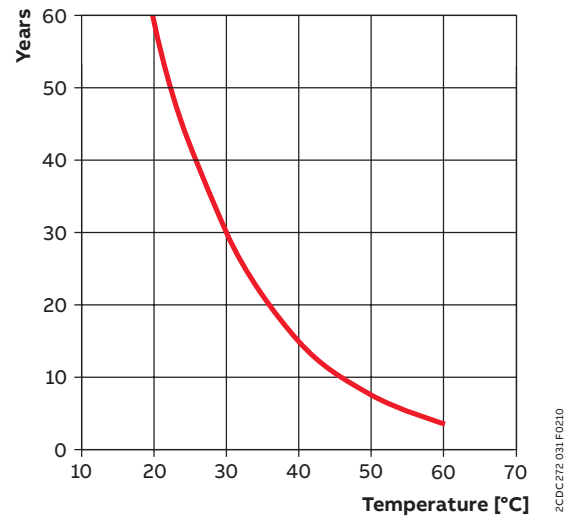
CP-B range

Technical diagrams

Characteristic curve of the temperature at rated load



Capacitors life span over temperature



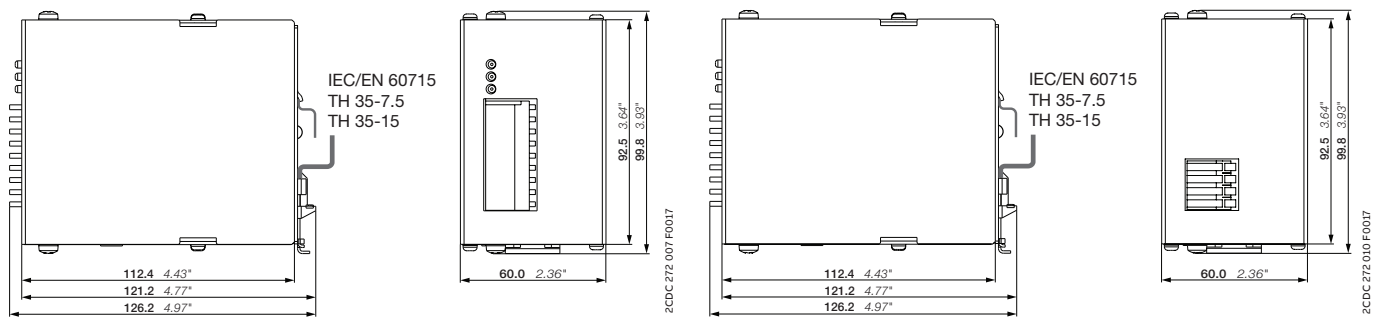
- A Normal application (up to 50 % buffer mode, 5 charging and discharging cycles in direct series)
- B Continuous charging and discharging in direct series. As this is not typical of a real application, this should be considered as theoretical indication

CP-B range

Technical diagrams

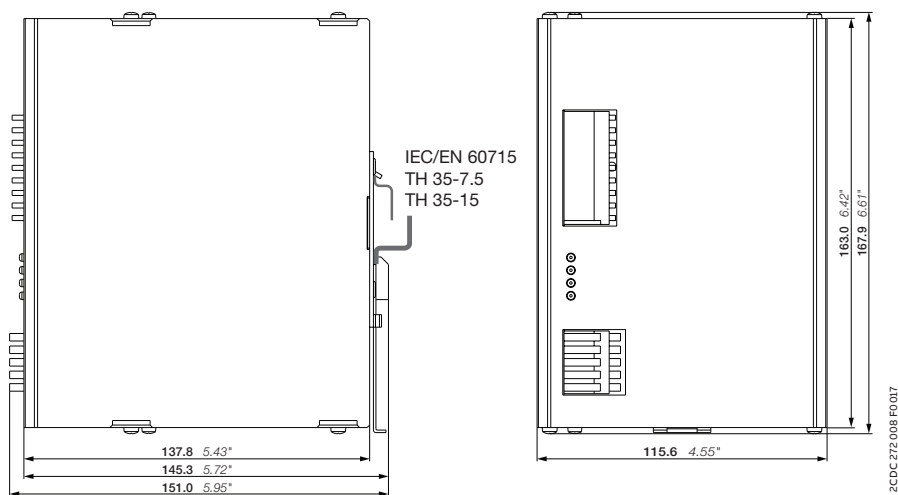
Dimensional drawings

Dimensions in mm and inches

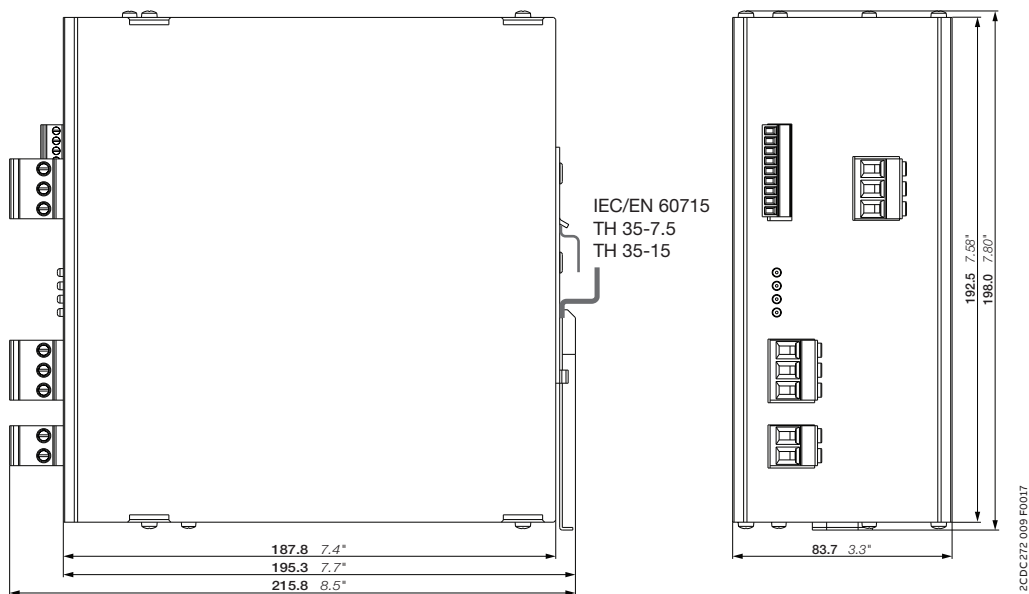


CP-B 24/3.0

CP-B EXT.2



CP-B 24/10.0



CP-B 24/20.0



Redundancy units

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97	Benefits and advantages
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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

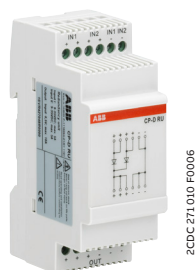
Ordering details



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.) kg (lb)
10 - 28.5 V DC	20 A	24 V DC / 2 x 20 A or 1 x 40 A	uncoated	CP-C.1-A-RU	1SVR360060R1001	1.04 (2.29)
			coated	CP-C.1-A-RU-C	1SVR360060R2001	1.04 (2.29)
			uncoated	CP-C.1-A-RU-L	1SVR361060R1001	1.04 (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.) kg (lb)
9-35 V DC	2 x 5 A	24 V DC / 1 x 10 A	CP-D RU	1SVR427049R0000	0.075 (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.) kg (lb)
5-35 V DC	0.5 - 2.5 A	24 V DC / 5 A	CP-RUD	1SVR423418R9000	0.088 (0.195)

Redundancy units

Technical data

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

Type	CP-C.1-A-RU, CP-C.1-A-RU-L		CP-C.1-A-RU-C
Input circuit - Supply circuit		(+/-, -/-)	
Rated input voltage U _{in}		24 V DC	
Input voltage range		10-28.5 V DC	
Rated input current I _{in} per channel	-25 °C ≤ T _a ≤ 60 °C	20 A	
Maximum input current per channel	-25 °C ≤ T _a ≤ 40 °C	30 A	
	-40 °C ≤ T _a ≤ 40 °C	-	30 A
Transient overvoltage protection		yes, varistor	
Output circuit		(++/--)	
Rated output voltage U _{out}		24 V DC	
Voltage drop input/output		typ. 0.6 V, max. 0.9 V	
Rated output current I _r	-25 °C ≤ T _a ≤ 60 °C	2 x 20 A or 1 x 40 A	
Max. output current (Power reserve)	-25 °C ≤ T _a ≤ 40 °C	2 x 30 A or 1 x 60 A	
	-40 °C ≤ T _a ≤ 40 °C	-	2 x 30 A or 1 x 60 A
Derating of the output current	60 °C < T _a ≤ 70 °C	2.5 % per Kelvin temperature increase	
Resistance to reverse feed		< 60 V	
General data			
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	
Electrical connection - Input circuit / Output circuit			
Connecting capacity	fine-strand with(out) wire end ferrule	2.5-10 mm ² (12-8 AWG)	
	rigid	2.5-16 mm ² (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 testing period: 21 days ambient conditions: 25 °C, 75 % r.h. air/volume change rate per hour: 3-6 sample not energized during exposure gas concentrations acc. ISA-S71.04.2013 Harsh Group A, G3 IEC 60721-3.3 acc. 3C2/3C3 - H2S ≥ 100 ± 10 ppb - SO2/SO3 ≥ 300 ± 20 ppb - Cl2 ≥ 100 ± 10 ppb - NOx ≥ 1250 ± 20 ppb
Isolation data			
Rated impulse withstand voltage U _{imp} (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

Type		CP-D RU
Input circuit - Supply circuit		IN 1 + + -, IN 2 + + -
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
Output circuit		OUT + + +, - - -
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
General data		
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)
Electrical connection - Input circuit / Output circuit		
Connecting capacity	fine-strand with (out)wire end ferrule	0.2-2.5 mm ² (24-14 AWG)
	rigid	0.2-2.5 mm ² (24-12 AWG)
Stripping length		7.0 mm (0.28 in)
Tightening torque		0.67 Nm (6 lb.in)
Environmental data		
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: 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
Standards / Directives		
Standards		IEC/EN 61204-3, IEC/EN 60950-1
RoHS Directive		2011/65/EU
Electromagnetic compatibility		
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

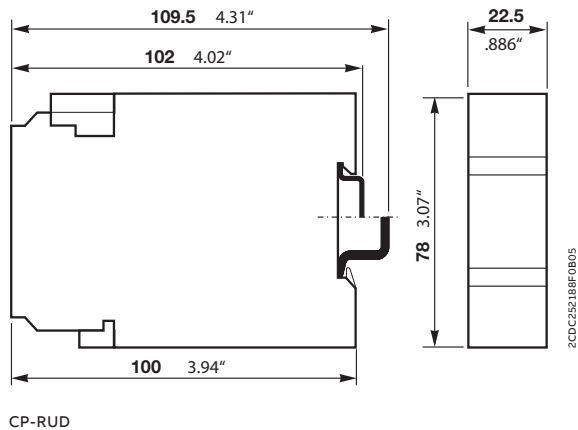
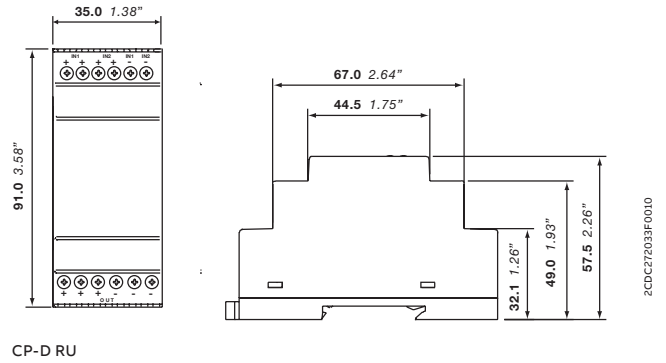
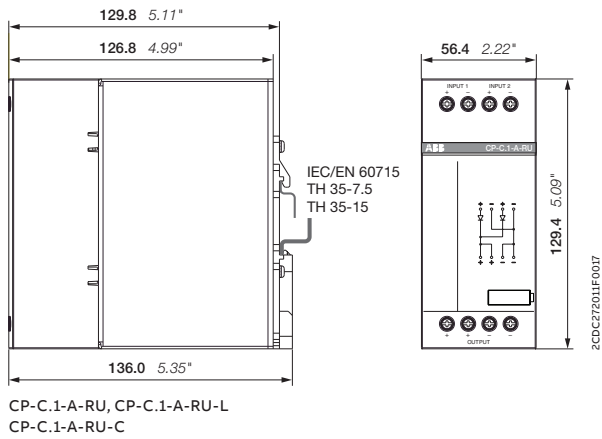
Type			CP-RUD
Input circuit - Supply circuit			A: U1+/-U ; B: U2+/-U
Rated input voltage U _{in}			24 V DC
Input voltage range			5-35 V DC
Rated input current I _{in} per channel			0.5-2.5 A
Maximum input current per channel			10 A for 300 s
Transient overvoltage protection			no
Output circuit			L+, L+, L+, L-, L-, L-
Rated output voltage U _{out}			24 V DC
Voltage drop			typ. 0.6 V, max. 0.7 V
Rated output current I _{out}			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

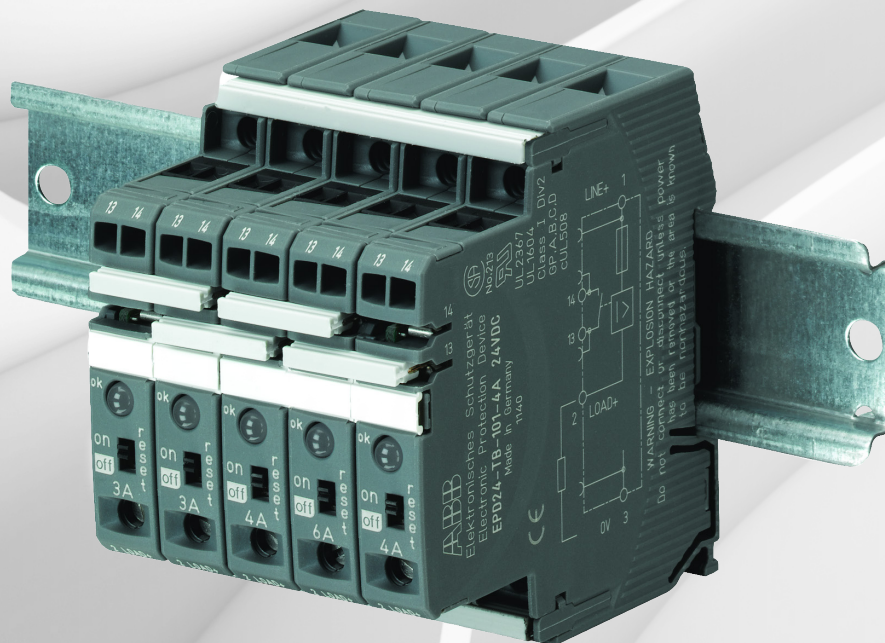
Redundancy units

Technical diagrams

Dimensional drawings

Dimensions in **mm** and **inches**





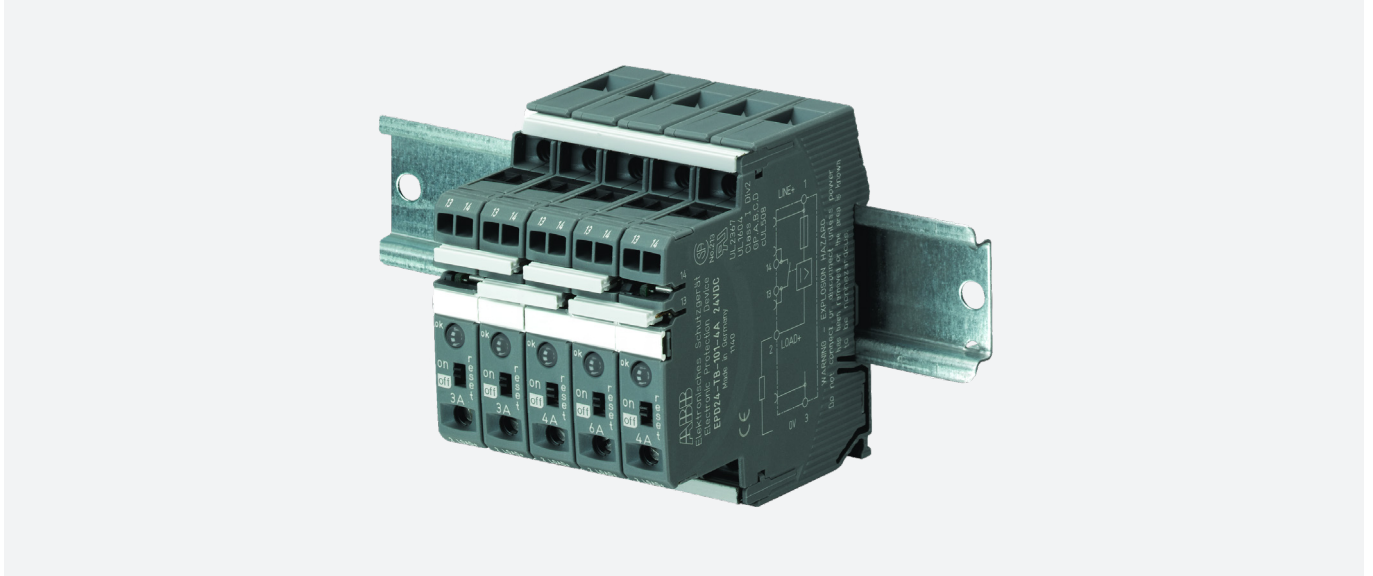
Electronic protection devices EPD24

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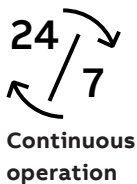
Electronic protection devices EPD24

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.



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 μF 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 50010

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

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

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

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 load circuit / Power-MOSFET is switched on
	Orange: in the event of overload or short circuit until electronic disconnection
	Red: unit electronically disconnected load circuit/Power-MOSFET OFF 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 $I_{Load} > 1.1 \times I_N$ 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 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 no overload, no short circuit
OFF condition LED off	device switched off (switch is in OFF position) 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 Device switched off with control signal (switch is in ON position)
Aux. contact	single signal, make contact contact open, terminal 13-14
Fault	signal output fault conditions no operating voltage U_B ON/OFF switch is in OFF position 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 terminals: IP20 DIN 40050
EMC (EMC directive, CE logo)	emission: EN 61000-6-3 susceptibility: EN 61000-6-2
Isolations coordination (IEC 60934)	0.5 kV/pollution degree 2 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 UL 1604, (class I, division 2, groups A, B, C, D) UL 508 CSA C22.2 No. 213 (class I, division 2) CSA C22.2 No. 142 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 ²
Multi-lead connection (2 identical cables) rigid/flexible	0.5 – 4 mm ²
Flexible with wire end ferrule without plastic sleeve	0.5 – 2.5 mm ²
Flexible with TWIN wire end ferrule with plastic sleeve	0.5 – 6 mm ²
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 ²
Wire stripping length	8 mm
Tightening torque (EN 60934)	0.5 Nm

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

current rating I_N	typically voltage drop U_{ON} at I_N	active current 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_{ambient} = 25 °C)

The trip time is typically 3 s in the range between $1.1 \times I_N^{1)}$ and $1.8 \times I_N^{1)}$.

Electronic current limitation occurs at typically $1.8 \times I_N^{1)}$ 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 $1.8 \times I_N^{1)}$ 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_{max} .

Calculation of R_{max}

Selected rating I_N (A)	3	6
Operating voltage U_g (V DC) (= 80 % of 24 V) ²⁾	19.2	19.2
Trip current $I_{ab} = 1.25 \times I_N$ (A) (EPD24 trips after 3 s)	3.75	7.50
$R_{max} (\Omega) = (U_g / I_{ab}) - 0.050$	5.07	2.51

²⁾ 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 ²)	0.14	0.25	0.34	0.5	0.75	1.00	1.50
Cable length L (m) (= single length)	cable resistance (Ω) = $(\rho_0 \times 2 \times L) / A^{3)}$						
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

³⁾ Resistivity of copper $\rho_0 = 0.0178 (\Omega \times \text{mm}^2)/\text{m}$

Example 1: max. length for 1.5 mm² and 3 A: 214 m

Example 2: max. length for 1.5 mm² and 6 A: 106 m

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

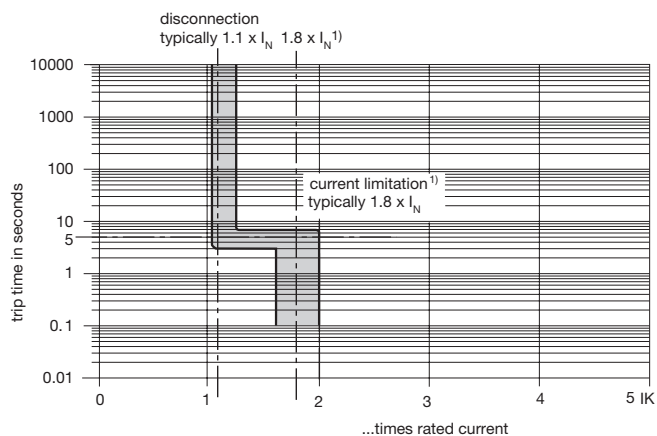
R1 = 40 m for 1.5 mm² and R2 = 5 m for 0.25 mm²:

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

Electronic protection devices EPD24

Technical diagrams

Time/current characteristic curve

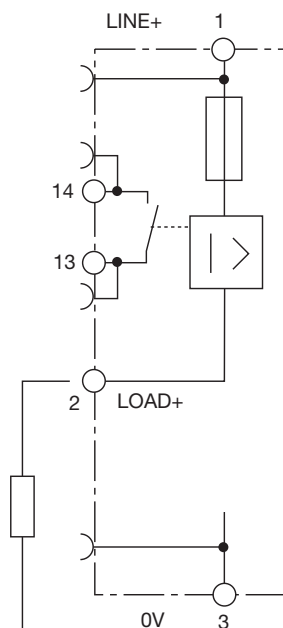


¹⁾ Current limitation typically $1.8 \times I_N$ at $I_N = 0.5 \text{ A} \dots 6 \text{ A}$
 Current limitation typically $1.5 \times I_N$ at $I_N = 8 \text{ A}$ or 10 A
 Current limitation typically $1.3 \times I_N$ at $I_N = 12 \text{ A}$

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)

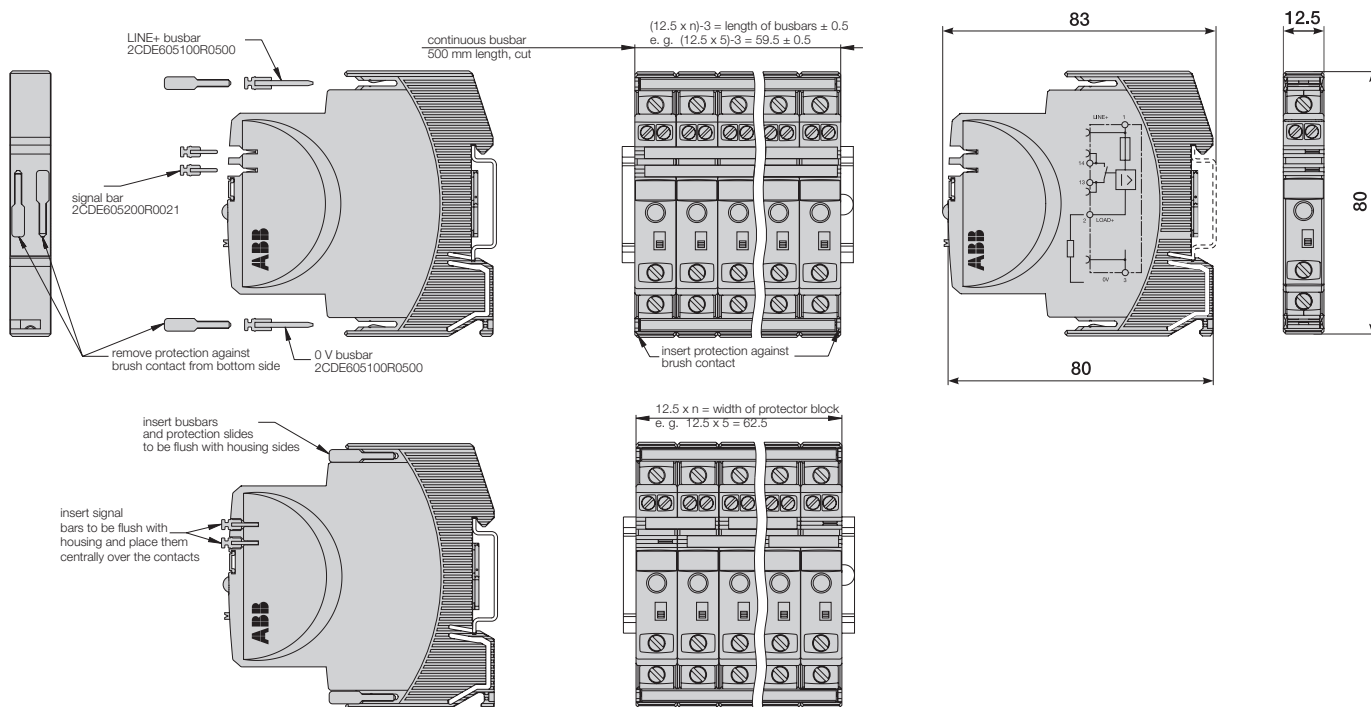
Electronic protection devices EPD24

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) ± 0.5 mm	22	34.5	47	59.5	72	84.5	97	109.5	122

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Product type

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CP-B 24/20.0	1SVR427060R2000	88
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CP-B EXT.2	1SVR427065R0000	88
CP-C.1 24/10.0	1SVR360663R1001	50
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CP-C.1 24/10.0-L	1SVR361663R1001	50
CP-C.1 24/20.0	1SVR360763R1001	50
CP-C.1 24/20.0-C	1SVR360763R2001	50
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