



## Switch mode power supplies CP-B Range

# Type CP-B Switch mode Power supplies



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 efforts and costs.

Using the latest 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 for power supply units which ensures a short term uninterrupted power supply system. In case of a power loss, the energy stored in the capacitor guarantees that the load is continually provided 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 kW<sub>s</sub>1))  
CP-B 24/10.0 (10 A / 10 kW<sub>s</sub>1))  
CP-B 24/20.0 (20 A / 8 kW<sub>s</sub>1))
  - CP-B 24/3.0 and CP-B 24/20.0 expandable with additional extension module(s) CP-B EXT.2 (2 kW<sub>s</sub>1))
  - 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
  - Advantages in comparison to battery buffers
  - Maintenance free
  - No deep discharge
  - Temperature resistant
  - approval (UL508, CSA22.2 No 14)
- 1) internal energy buffer

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

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

## CP-B Range Ordering data

### Description

Ultra capacitor based buffer units of the CP-B range offer highest reliability also in harsh environment. Due to the 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 to avoid voltage drops, for example in solar applications.



CP-B 24/3.0



CP-B 24/10.0



CP-B 24/20.0

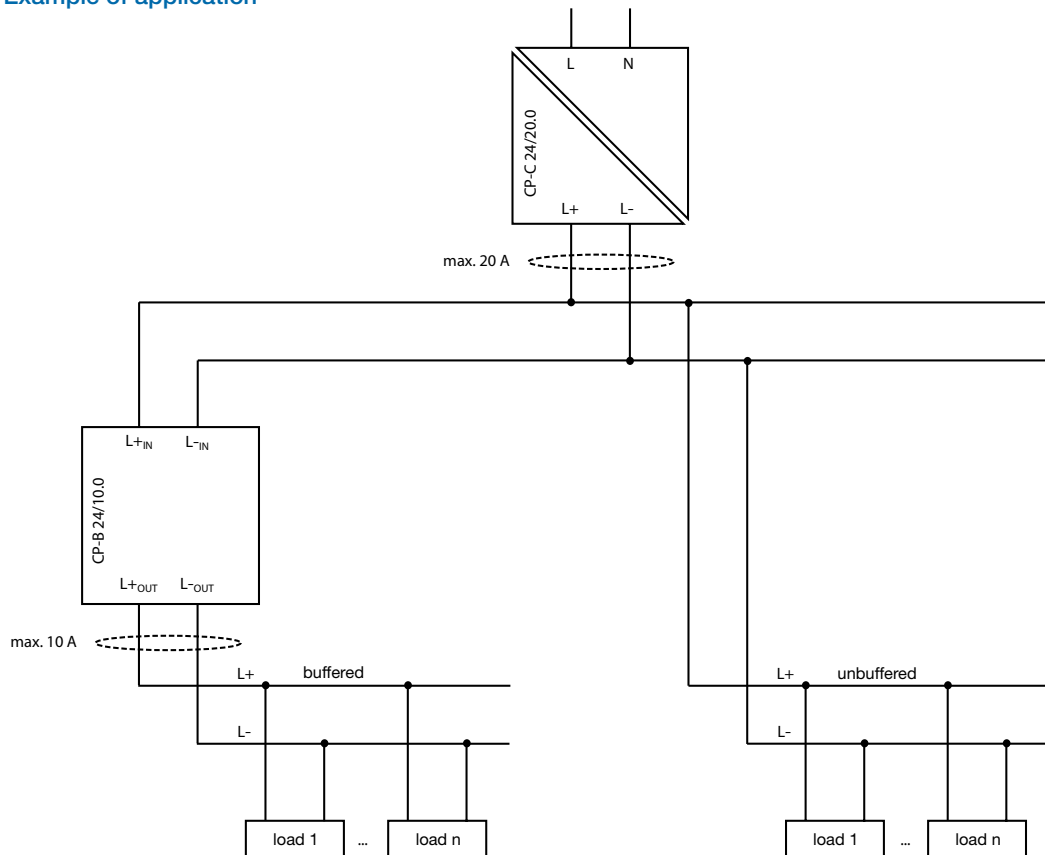
### Ordering details

Rated input voltage	Rated current	Type	Catalog number	Weight (1 pce) kg (lb)
24 V DC	3 A DC	CP-B 24/3.0	1SVR427060R0300	0.55 (1.21)
	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

Rated voltage	Voltage range	Type	Catalog number	Weight (1 pce) kg (lb)
24 V DC	0-26.4 V DC	CP-B EXT.2	1SVR427065R0000	1.00 (2.20)

### Example of application



# CP-B Range

## Technical data

Data at Ta = 25 °C and rated values, unless otherwise indicated

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 <sub>in</sub>			24 V DC	
Input voltage range		23.7-26.4 V DC	23.9-27 V DC	23.4-27.4 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)
Kind of input	SHUT-DOWN	-	control input	control input
	rated voltage	-	24 V DC	24 V DC
	voltage range	-	6-45 V DC	6-45 V DC
<b>Output circuit</b>			L+OUT L-OUT L-OUT	
Rated output power		69 W	240 W	480 W
Rated output voltage U <sub>out</sub>			24 V DC	
Output voltage (buffer mode)		23.0 V DC	23.2 V DC	23.2 V DC
Tolerance of the output voltage			+2..-10 %	
Rated output current I <sub>r</sub>	Ta m 60 °C	3 A DC	10 A DC	20 A DC
Peak output current (fully loaded capacitors required)	Ta m 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)
Short-circuit protection (only via external fuse)			no continuous short-circuit stability	
Required external fuse		3.15 A slow acting	10 A slow acting	25 A slow acting
Power failure buffering time		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	-	n/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	125 V AC / 0.5 A, 60 V DC / 1 A	
Mechanical lifetime			5 x 10 <sup>6</sup> switching cycles	
Electrical lifetime			0.1 x 10 <sup>6</sup> switching cycles	
Maximum fuse rating to achieve short-circuit protection	n/o contact		1.0 A AC / 0.5 A DC	
<b>General data</b>				
Maximum internal power consumption		7 W	20 W	40 W
Power consumption with unloaded output		0.75 W	3 W	1.6 W
Energy storage (min.)		1000 Ws	10000 Ws	8000 Ws
Typical charging time at load current	100 %	65 s	134 s	135 s
	0 %	56 s	82 s	62 s
Typical buffering time at load current <sup>1)</sup>	100 %	13 s	38 s	15 s
	50 %	28 s	76 s	30 s
	25 %	66 s	140 s	60 s
	10 %	148 s	380 s	150 s
Efficiency			greater than 90 %	
Dimensions (W x H x D)	product dimensions	60 x 99 x 120 mm [2.36 x 3.90 x 4.72 in]	116 x 170 x 147 mm [4.57 x 6.69 x 5.79 in]	84 x 197 x 213 mm [3.31 x 7.76 x 8.39 in]
Weight	net weight	0.55 kg [1.21 lb]	2.1 kg [4.63 lb]	2.2 kg [4.85 lb]
Material	cover / housing shell		steel sheet powdered	
Mounting			DIN rail (IEC/EN 60715), snap-on mounting without any tool	
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
Wire size	fine-strand with(out) wire end ferrule	0.08-1.0 mm <sup>2</sup> (28-18 AWG)	0.08-1.5 mm <sup>2</sup> (28-18 AWG)	0.2-4.0 mm <sup>2</sup> (24-12 AWG)
	rigid	0.08-1.5 mm <sup>2</sup> (28-16 AWG)	0.08-4.0 mm <sup>2</sup> (28-16 AWG)	0.2-6.0 mm <sup>2</sup> (24-10 AWG)
Stripping length		6.0 mm [0.24 in]		7.0 mm [0.28 in]
Signalling circuit				

# CP-B Range

## Technical data

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

Type		CP-B 24/3.0	CP-B 24/10.0	CP-B 24/20.0
Wire size	fine-strand with(out) wire end ferrule	0.08-1.0 mm <sup>2</sup> (28-18 AWG)		0.14-1.0 mm <sup>2</sup> (26-16 AWG)
	rigid	0.08-1.5 mm <sup>2</sup> (28-16 AWG)		0.14-1.5 mm <sup>2</sup> (28-16 AWG)
Stripping length		6.0 mm [0.24 in]		7.0 mm [0.28 in]
<b>Environmental data</b>				
Ambient temperature	operation	-40...+60 °C		-20...+60 °C
	storage	-40...+60 °C		-20...+60 °C
<b>Standards</b>				
Product standard		EN 50178		
Low Voltage Directive		2006/95/EC		
EMC Directive		2004/108/EC		
RoHS Directive		2002/95/EC		
Electrical safety		EN 50178, EN 60950, UL 508		
<b>Electromagnetic compatibility</b>				
Interference immunity to	electrostatic discharge	IEC/EN 61000-4-2	IEC/EN 61000-6-1, IEC/EN 61000-6-2 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		
		EN 61000-6-3, EN 61000-6-4		
Interference emission	high-frequency radiated	DIN EN 55011	B/C1	
	high-frequency conducted	DIN EN 55011	B/C1	

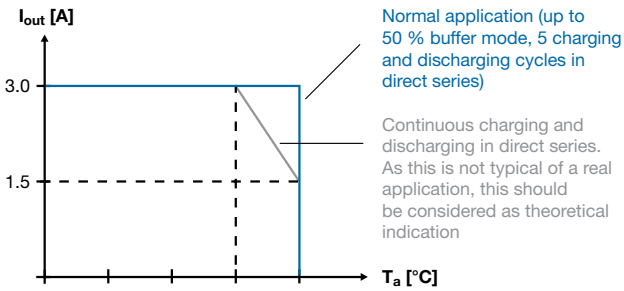
$${}^1) \text{ buffering time } \approx \frac{\text{energy storage} \times 0.9}{\text{load current} \times 23.0 \text{ V}}$$

Approvals and marks\* on page 11.2.

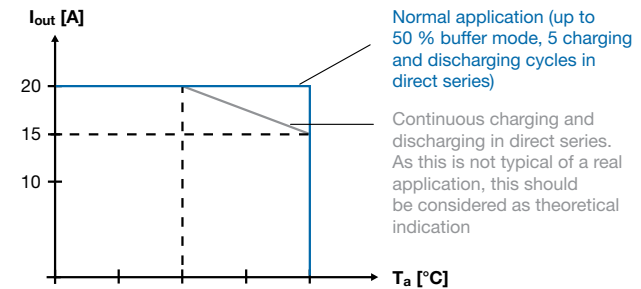
### Technical diagrams

Output curve at  $T_u = 25\text{ °C}$

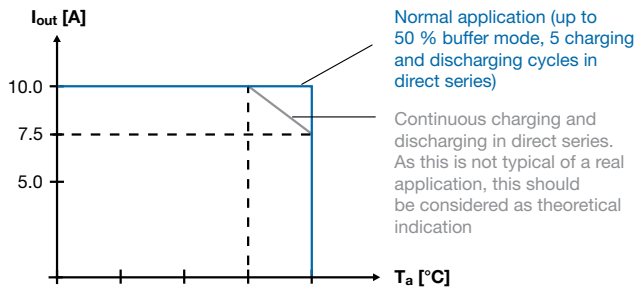
dimensions in mm



CP-B 24/3.0

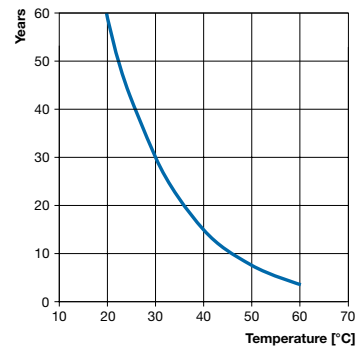


CP-B 24/20.0



CP-B 24/10.0

Characteristic curve of the temperature at rated load



Capacitor's life span over temperature

# CP-B Range

## Technical data

Data at Ta = 25 °C and rated values, unless otherwise indicated

<b>Type</b>		CP-B EXT 2.0
<b>Extension circuit</b>		EXT+ EXT+ EXT- EXT- 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
<b>Indication of operational states</b>		status information and fault messages of the buffer module apply
<b>General data</b>		
Power consumption without load		0.5 W
Energy storage (min.)		2000 Ws
Dimensions (W x H x D)		product dimensions 60 x 99 x 120 mm [2.36 x 3.90 x 4.72 in] packaging dimensions 85 x 220 x 170 mm [3.35 x 8.66 x 6.69 in]
Weight		net weight 1.00 kg (0.20 lb)
Material		cover / housing shell steel sheet powdered
Mounting		DIN rail (IEC/EN 60715), snap-on mounting without any tool
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)
<b>Electrical connection - Extension circuit</b>		
Wire size		fine-strand with(out) wire end ferrule 0.08-1.0 mm <sup>2</sup> (28-18 AWG) rigid 0.08-1.5 mm <sup>2</sup> (28-16 AWG)
Stripping length		6.0 mm [0.24 in]
<b>Signalling circuit</b>		
Wire size		fine-strand with(out) wire end ferrule 0.08-1.0 mm <sup>2</sup> (28-18 AWG) rigid 0.08-1.5 mm <sup>2</sup> (28-16 AWG)
Stripping length		6.0 mm [0.24 in]
<b>Environmental data</b>		
Ambient temperature		operation -40...+60 °C storage -40...+60 °C
Standards		
Product standard		EN 50178
Low Voltage Directive		2006/95/EC
EMC Directive		2004/108/EC
RoHS Directive		2002/95/EC
Electrical safety		EN 50178, EN 60950, UL 508
<b>Electromagnetic compatibility</b>		
Interference immunity to		IEC/EN 61000-6-1, 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 61000-6-3, EN 61000-6-4
high-frequency radiated		DIN EN 55011 B/C1
high-frequency conducted		DIN EN 55011 B/C1

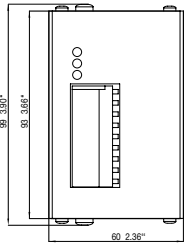
Approvals and marks on page 11.3.

# CP-B Range

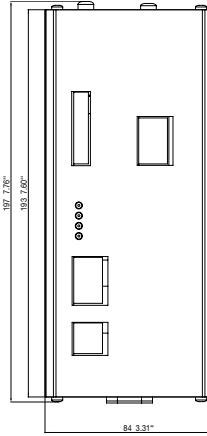
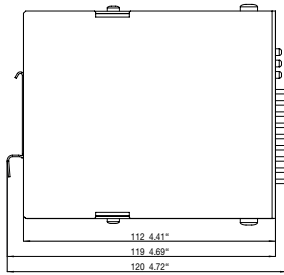
Approximate dimensions

## Dimensional drawings

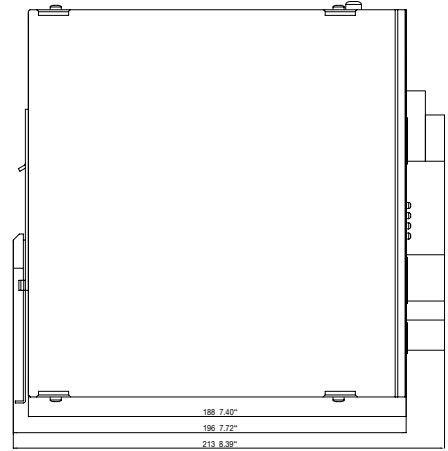
dimensions in mm



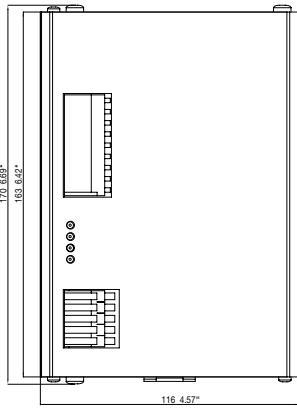
CP-B 24/3.0



CP-B 24/20.0



11



CP-B 24/10.0

