

**NEW**

## Ultra capacitor based buffer modules CP-B range



4

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.

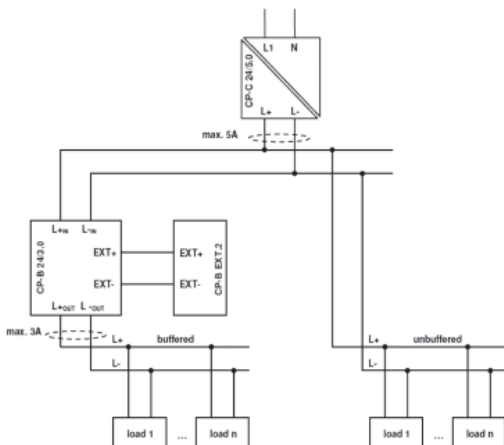
The CP-B range is an ultra-capacitor buffer energy storage for power supply units which ensures a short term uninterrupted power supply system. In case of a power loss, the energy stored in the capacitor guarantees that the load is continually provided up to several hundred seconds depending on the load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

### Characteristics

- 3 buffer modules for buffering 24 V DC:
  - CP-B 24/3.0 (3 A / 1 kW<sup>1)</sup>)
  - CP-B 24/10.0 (10 A / 10 kW<sup>1)</sup>)
  - CP-B 24/20.0 (20 A / 8 kW<sup>1)</sup>)
- CP-B 24/3.0 and CP-B 24/20.0 expandable with additional extension module(s) CP-B EXT.2 (2 kW<sup>1)</sup>)
- LEDs for status indication
- Relay contacts for status messaging
- Very high backup times (e.g. with CP-B 24/10.0 up to 8 minutes at 1 A load current)
- Short charging times
- High efficiency, higher than 90%
- Wide temperature range
- DIN rail mountable, compact enclosures
- Advantages in comparison to battery buffers
  - Maintenance free
  - No deep discharge
  - Temperature resistant
- approval (UL508, CSA22.2 No 14)<sup>2)</sup>

<sup>1)</sup> internal energy buffer; <sup>2)</sup> pending

### Application example



**NEW**

# Ultra capacitor based buffer modules

## CP-B range

### Product selection table

		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	–
Energy storage (min.)		1.000 Ws	10.000 Ws	8.000 Ws	2.000 Ws
Typical charging time at load current	100 %	65 s	120 s	68 s	
	0 %	56 s	82 s	62 s	
Typical buffer time <sup>1)</sup> at load current	100 %	14 s	40 s	15 s	
	50 %	28 s	80 s	30 s	
	25 %	74 s	140 s	60 s	
	10 %	148 s	380 s	150 s	
Dimensions					
Width		60.00 mm	127.00 mm	84.00 mm	60.00 mm
Height		92.50 mm	163.00 mm	192.00 mm	92.50 mm
Depth		116.00 mm	150.00 mm	198.00 mm	116.00 mm

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

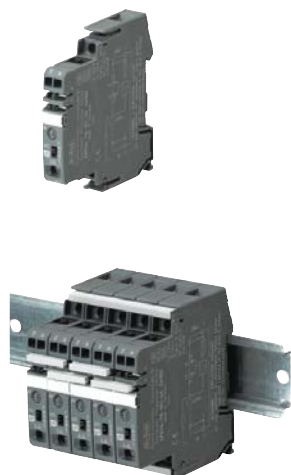
4



Type	Rated input voltage	Rated current	Order code	Pack. unit pieces	Price 1 piece	Weight 1 piece kg / lb
<b>CP-B range</b>						
CP-B 24/3.0	24 V DC	3 A DC	1SVR 427 060 R0300	1		0.55 / 1.21
CP-B 24/10.0	24 V DC	10 A DC	1SVR 427 060 R1000	1		2.10 / 4.63
CP-B 24/20.0	24 V DC	20 A DC	1SVR 427 060 R2000	1		2.20 / 4.85
CP-B EXT.2	–	–	1SVR 427 065 R0000	1		1.00 / 2.21

**NEW**

## Electronic Protection Devices for use behind 24 V DC Switch Mode Power Supplies

**EPD24-TB-101**

The protection devices EPD24 extend the ABB product range of modular DIN rail components by electronic overcurrent protection modules for selective protection of 24V 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, disable the power output transistor and hence interrupt the current flow in the defective circuit. The maximum possible overcurrent is always limited to 1.5...1.8 times the selected rated current. An activation of capacitive loads up to 20,000  $\mu\text{F}$  is possible, deactivation only occurring in the case of overloads or short circuits. Selective deactivation of the defective current circuit means undefined error states and a complete system stop are prevented.

### Features

- Selective load protection one, electronic trip characteristics.
- Active current limitation for safe connection of capacitive loads up to 20,000  $\mu\text{F}$  and on overload/short circuit.
- Current ratings 0.5 A...12 A.
- Reliable overload disconnection with  $1.1 \times I_N$
- Manual ON/OFF button
- Clear status and failure indication through LED and 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.

### Selection table

Rated current $I_n$ in A	Order details Type code	Order code	bbn 40 16779 EAN	Price 1 piece	Price group	Weight 1 piece kg	Pack unit pc.
0.5	EPD24-TB-101-0.5A	2CDE 601 101 R2905	829960			0.065	4
1	EPD24-TB-101-1A	2CDE 601 101 R2001	829984			0.065	4
2	EPD24-TB-101-2A	2CDE 601 101 R2002	830003			0.065	4
3	EPD24-TB-101-3A	2CDE 601 101 R2003	830027			0.065	4
4	EPD24-TB-101-4A	2CDE 601 101 R2004	830041			0.065	4
6	EPD24-TB-101-6A	2CDE 601 101 R2006	830065			0.065	4
8	EPD24-TB-101-8A	2CDE 601 101 R2008	830089			0.065	4
10	EPD24-TB-101-10A	2CDE 601 101 R2010	830102			0.065	4
12	EPD24-TB-101-12A	2CDE 601 101 R2012	830126			0.065	4

### Selection table accessories

	Order details Type code	Order code	bbn 40 16779 EAN	Price 1 piece	Price group	Weight 1 piece kg	Pack unit pc.
Busbars for LINE+ and 0 V, grey insulation, length 500 mm <sup>1)</sup>	EPD-BB500	2CDE 605 100 R0500	830140			0.20	10
Signal Bars for aux. contacts, grey insulation, length 21 mm	EPD-SB21	2CDE 605 200 R0021	830164			0.04	10

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



**NEW**

# Electronic Protection Devices EPD24-TB-101

## Technical data ( $T_{amb.} = 25\text{ °C}$ , $U_B = 24\text{ V DC}$ )

for use behind 24 V DC Switch Mode Power Supplies

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	<b>Line+/LOAD+/0V</b>
Screw terminals	M4
Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve	0.5 – 10 mm <sup>2</sup>
Multi-lead connection (2 identical cables) rigid/flexible	0.5 – 4 mm <sup>2</sup>
Flexible with wire end ferrule without plastic sleeve	0.5 – 2.5 mm <sup>2</sup>
Flexible with TWIN wire end ferrule with plastic sleeve	0.5 – 6 mm <sup>2</sup>
Wire stripping length	10 mm
Tightening torque (EN 60934)	1.5 – 1.8 Nm
Terminals	<b>aux. contacts</b>
Screw terminals	M3
Max. cable cross section flexible with wire end ferrule w/wo plastic sleeve	0.25 - 2.5 mm <sup>2</sup>
Wire stripping length	8 mm
Tightening torque (EN 60934)	0.5 Nm

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

current rating $I_N$	typically voltage drop $U_{ON}$ at $I_N$	active current max. load current at 100 % ON duty		
		limitation (typically)	$T_{ambient} = 40\text{ °C}$	$T_{ambient} = 40\text{ °C}$
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 not carry more than 80 % of its rated load with 100% ON duty due to thermal effects.

**NEW**

# Technical details

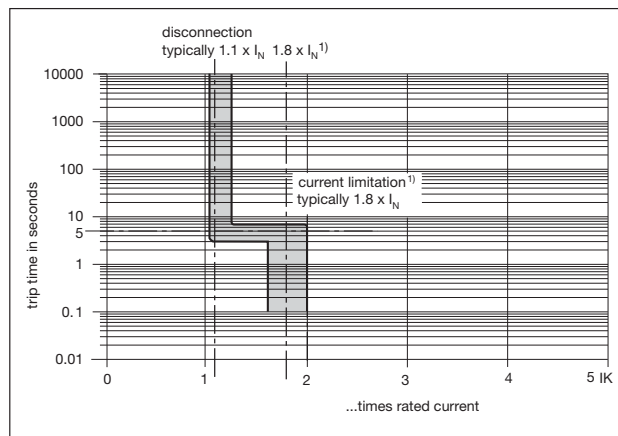
## EPD 24-TB-101

### Tripping curve and max. cable lengths

# Protection devices

#### Time/Current characteristic curve ( $T_U = 25\text{ °C}$ )

- The trip time is typically 3 s in the range between  $1.1 \times I_N$  and  $1.8 \times I_N$ .
- Electronic current limitation occurs at typically  $1.8 \times I_N$ <sup>1)</sup> which means that under all overload conditions (independent of the power supply and the resistance of the load circuit) the max. overload before disconnection will not exceed  $1.8 \times I_N$  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.



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

#### Maximum cable lengths

EPD24 reliably trips from  $0\ \Omega$  up to max. circuit resistance  $R_{max}$ .

#### Calculation of $R_{max}$

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

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

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

Cable cross section A (mm <sup>2</sup> )	0.14	0.25	0.34	0.5	0.75	1.00	1.50
Cable length L (m) (= single length)	<b>cable resistance (<math>\Omega</math>) = (<math>\rho_0 \times 2 \times L</math>) / A<sup>3)</sup></b>						
5	1.27	0.71	0.52	0.36	0.24	0.18	0.12
10	2.54	1.42	1.05	0.71	0.47	0.36	0.24
15	3.81	2.14	1.57	1.07	0.71	0.53	0.36
20	5.09	2.85	2.09	1.42	0.95	0.71	0.47
25	6.36	3.56	2.62	1.78	1.19	0.89	0.59
30	7.63	4.27	3.14	2.14	1.42	1.07	0.71
35	8.90	4.98	3.66	2.49	1.66	1.25	0.83
40	10.17	5.70	4.19	2.85	1.90	1.42	0.95
45	11.44	6.41	4.71	3.20	2.14	1.60	1.07
50	12.71	7.12	5.24	3.56	2.37	1.78	1.19
75	19.07	10.68	7.85	5.34	3.56	2.67	1.78
100	25.34	14.24	10.47	7.12	4.75	3.56	2.37
125	31.79	17.80	13.09	8.90	5.93	4.45	2.97
150	38.14	21.36	15.71	10.68	7.12	5.34	3.56
175	44.50	24.92	18.32	12.46	8.31	6.23	4.15
200	50.86	28.48	20.94	14.24	9.49	7.12	4.75
225	57.21	32.04	23.56	16.02	10.68	8.01	5.34
250	63.57	35.60	26.18	17.80	11.87	8.90	5.93

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

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

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

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

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

R1 = 0.95  $\Omega$ , R2 = 0.71  $\Omega$ , **total (R1 + R2) = 1.66  $\Omega$**



## Technical details

### EPD 24-TB-101

#### Approvals, safety instructions

## Protection devices

### Please note

The user should 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 98/37/EG and 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



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

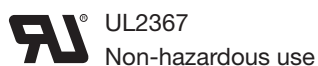
Type: E4008, E4009, or E6008

#### RECOMMENDATION:

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

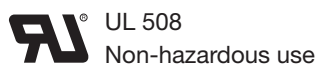
#### WARNING – EXPLOSION HAZARD:

- 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 508

Non-hazardous use



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

CSA C22.2 No. 142

Class 2

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

**NEW**

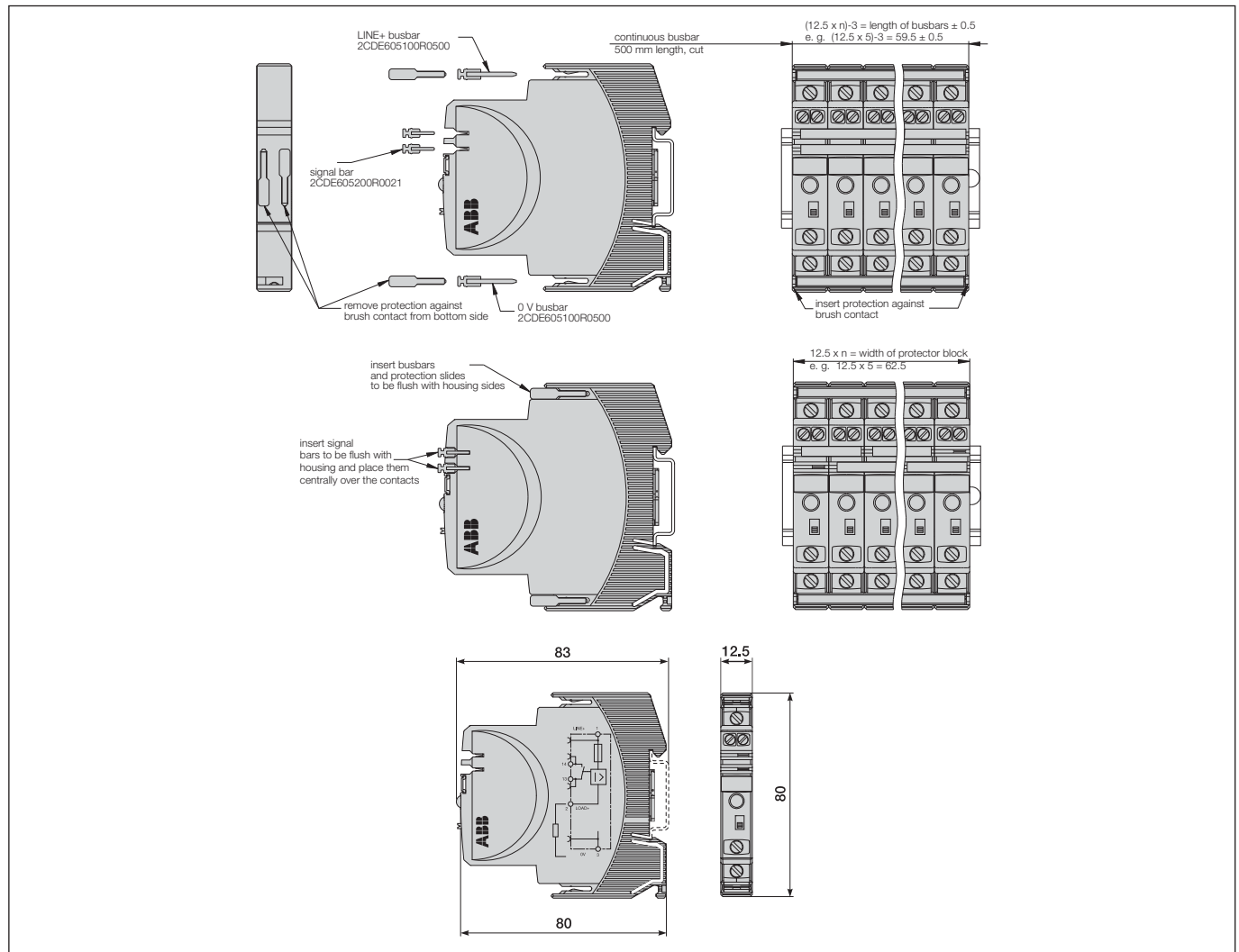
# Technical details EPD 24-TB-101, Installation guidelines

## Protection devices

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



4

### 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