

Electronic protection device

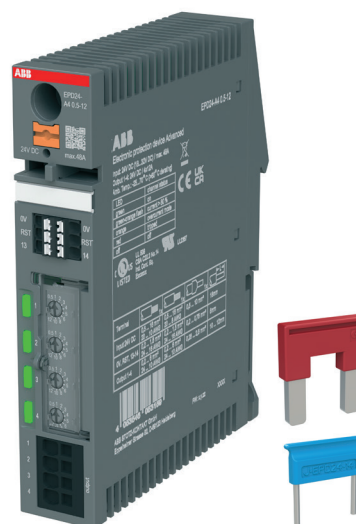
Entry EPD24-E4 1-10

Advanced EPD24-A4 0.5-12

Selective protection of 24 V DC load circuits

Electronic protection devices are used for the reliable protection of standard components in industrial automation applications with 24 V DC. The EPD24 offer selective over-current protection for the loads connected and react to short circuit or overload more rapidly than the supplying switch mode power supply; they then selectively switch off the electrical circuit affected. In this way straightforward, quick troubleshooting is made possible.

The 4-channel devices feature very high efficiency and significantly reduced power loss. With a rated current setting from 0.5 to 12 A, a width of 25 mm, seamless expandability by means of jumpers, front-top wiring and straightforward combination with ABB switch mode power supplies, they ensure a uniform portfolio.



EPD24-A4 0.5-12,
Power jumper for 24 V DC and signal jumper for 0 V, signal and reset

Characteristics

- 4-channel electronic protection device
- 24 V DC supply terminal
- Variable rated currents can be set on **Advanced** from 0.5 A to 12 A or on **Entry** from 1 A to 10 A
- Selective load protection using electronic trip characteristic curve
- **Advanced** with active linear current limiting, total current max. 48 A
- **Entry** with time-controlled tripping, total current max. 40 A
- Integrated fail-safe element matched to the maximum rated current
- Very high efficiency
- No derating up to 60 °C ambient temperature
- Switching on of capacitive loads up to 40,000 µF at 12 A rated current
- ON/OFF/Reset button with multicolor LED status indicator
- Signal output (13, 14) with 1 NO contact for group signaling
- Reset input (RST) for remote resetting of tripped channels
- All connection terminals equipped with push-in terminals
- Several devices can be combined using power jumpers for supply and signal jumpers for 0 V, signal and reset
- **Entry** and **Advanced** devices can be combined using jumpers



UL 508
CSA C22.2 No. 14
Ind. Cont. Eq.
E321314



Ordering details

Electronic protection devices

Order code	Type	Function	Input	Characteristics	Channels	Rated current
2CDE601102R0110	EPD24-E4 1-10	Entry	24 V DC	Time-controlled tripping	4	1–10 A
2CDE601102R0512	EPD24-A4 0.5-12	Advanced	24 V DC	Active current limiting	4	0.5–12 A

Accessories

Order code	Type	Characteristics
2CDE605300R0010	EPD24 jumpers (1 sets)	1 power jumper for 24 V DC and 3 signal jumpers for 0 V, signal and reset
2CDE605300R0050	EPD24 jumpers (5 sets)	5 power jumpers for 24 V DC and 15 signal jumpers for 0 V, signal and reset
2CDE605300R0250	EPD24 jumpers (25 sets)	25 power jumpers for 24 V DC and 75 signal jumpers for 0 V, signal and reset

Technical data

Data for rated values $T_a = 23\text{ °C}$, $U_{in} = 24\text{ V DC}$, unless otherwise specified.

		Entry EPD24-E4 1-10	Advanced EPD24-A4 0.5-12
Input data			
Rated voltage U_{in}		24 V DC	
Operating voltage		18 .. 30 V DC	18 .. 32 V DC
Total rated current I_n		Max. 40 A	Max. 48 A
Suitable for battery-buffered applications		No	On request
Rated insulation voltage U_i		30 V DC (load circuit)	32 V DC (load circuit)
Standby current I_o		Typ. 33 mA	Typ. 17 mA
Reverse power supply		Max. 30 V DC	Max. 32 V DC
Reverse polarity protection		Yes, not including load	
Output data			
Output		Power MOSFET switching output (positive switching) without galvanic isolation	
Trip characteristic		Time-controlled tripping	Active current limiting
Fuse type		Electronic	
Overload tripping I_{OL} with trip time t_{OL}		See page 14, trip characteristic curve, Entry EPD24-E4 1-10 for time-controlled tripping Typ. I_{OL} at $>1.05 \times I_n$, typ. $t_{OL} = 3\text{ s}$ Typ. I_{OL} at $>1.35 \times I_n$, typ. $t_{OL} = 0.5\text{ s}$ Typ. I_{OL} at $>2.00 \times I_n$, typ. $t_{OL} = 0.1\text{ s}$ Typ. I_{OL} at $>2.5 \times I_n$, typ. $t_{OL} = 0.012\text{ s}$ Typ. I_{OL} at $>3.0 \times I_n$, typ. $t_{OL} = 0.002\text{ s}$	See page 15, trip characteristic curve, Advanced EPD24-A4 0.5-12 with active current limiting Typ. I_{OL} at $1.2 \times I_n$, typ. $t_{OL} = 3\text{ s}$
Short circuit tripping I_{SC} with trip time t_{SC}		See page 14, trip characteristic curve, Entry EPD24-E4 1-10 for time-controlled tripping Typ. I_{SC} at $>3.0 \times I_n$, typ. $t_{SC} = 0.002\text{ s}$	See page 15, trip characteristic curve, Advanced EPD24-A4 0.5-12 with active current limiting Typ. $t_{SC} = 0.01...1\text{ s}$ applies to: $I_n = 0.5\text{ A}$: typ. I_{SC} at $8 \times I_n$ $I_n = 1\text{ A}$: typ. I_{SC} at $4 \times I_n$ $I_n = 2\text{ A}$: typ. I_{SC} at $2 \times I_n$ $I_n = 3...5\text{ A}$: typ. I_{SC} at $1.6 \times I_n$ $I_n = 6...12\text{ A}$: typ. I_{SC} at $1.4 \times I_n$
Output voltage U_{out}		$U_{out} = U_{in} - (I_a \times 12\text{ mV/A})$ (typ. approx. 12 mV per 1 A)	$U_{out} = U_{in} - (I_a \times 14\text{ mV/A})$ (typ. approx. 14 mV per 1 A)
Number of outputs		4 channels	
Rated current setting per channel output I_a		1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 A	0.5 / 1 / 2 / 3 / 4 / 5 / 6 / 8 / 10 / 12 A
Rated current factory setting per channel output		10 A	12 A
Load current warning limit		Typ. 80 % I_n Warning limit hysteresis typ. 5 % (referred to I_n)	
If mounted individually: output current up to 60 °C per output (rated value)		10 A	12 A
	Derating 60 °C ... 70 °C	2 %/K per channel output	2.5 %/K per channel output
Parallel connection of outputs		Not permissible	
Freewheeling circuit		External freewheeling circuit for inductive load (design to suit load)	
Undervoltage tripping		OFF at typ. $U_{in} < 16\text{ V DC}$ ON at typ. $U_{in} > 19\text{ V DC}$ Hysteresis typ. 2 V	
Delay for switching on	Cascaded switching on of all outputs after power on with 24 V DC	Channel 1: typ. 100 ms Channel 2: typ. 200 ms Channel 3: typ. 300 ms Channel 4: typ. 400 ms	
	Cascaded switching on of all outputs after switching on the outputs remotely or after undervoltage	Channel 1: typ. 5 ms Channel 2: typ. 100 ms Channel 3: typ. 200 ms Channel 4: typ. 300 ms	
Fuse protection required		Not necessary, integrated fail-safe element	
Rated current, fail-safe element (per output channel)		16 A	25 A
Status indicator		LED (green, orange, red)	
Efficiency		99.4 %	99.3 %
Power loss		5.6 W at max. 40 A	8.5 W at max. 48 A
Capacitive load		Up to 20,000 μF (depending on the power supply unit and the current setting)	Up to 40,000 μF (depending on the power supply unit and the current setting)

	Entry EPD24-E4 1-10	Advanced EPD24-A4 0.5-12
Signal inputs and outputs		
SIGNAL OUTPUT 13-14		
Description	Group signal output 13-14	
Contact arrangement	Potential-free signal output, NO contact (optocoupler)	
Operating voltage	10 ... 30 V DC	
Operational current	1 ... 200 mA	
RESET RST		
Input voltage	8 ... 32 V DC (reset with rising edge)	
Current consumption	Typ. 2.8 mA (at 24 V DC)	
Pulse length	≥ 100 ms (high signal) ≥ 100 ms (low signal)	
Voltage	> 8 V DC (high signal) ≤ 3 V DC (low signal)	
Connection data		
INPUT Input 24 V DC		
Connection type	Push-in terminal	
Stripping length	18 mm	
Tool	Slotted screwdriver with a blade width of 3.5 mm	
Conductor cross-section, rigid	0.5 mm² ... 16 mm² AWG 20...10	
Conductor cross-section, flexible	0.5 mm² ... 16 mm² AWG 20...8	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.5 mm² ... 10 mm²	
INPUT 0 V		
Connection type	Push-in terminal	
Stripping length	8 mm	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, rigid	0.2 mm² ... 1.5 mm² AWG 24...16	
Conductor cross-section, flexible	0.2 mm² ... 1.5 mm² AWG 24...16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² ... 0.75 mm²	
OUTPUT 1-4		
Connection type	Push-in terminal	
Stripping length	10...12 mm	
Tool	Slotted screwdriver with a blade width of 3.5 mm	
Conductor cross-section, rigid	0.2 mm² ... 6 mm² AWG 24...10	
Conductor cross-section, flexible	0.2 mm² ... 6 mm² AWG 24...10	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.25 mm² ... 2.5 mm²	
SIGNAL OUTPUT 13-14		
Connection type	Push-in terminal	
Stripping length	8 mm	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, rigid	0.2 mm² ... 1.5 mm² AWG 24...16	
Conductor cross-section, flexible	0.2 mm² ... 1.5 mm² AWG 24...16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² ... 0.75 mm²	
RESET RST		
Connection type	Push-in terminal	
Stripping length	8 mm	
Conductor cross-section, rigid	0.2 mm² ... 1.5 mm² AWG 24...16	
Tool	Slotted screwdriver with a blade width of 2.5 mm	
Conductor cross-section, flexible	0.2 mm² ... 1.5 mm² AWG 24...16	
Conductor cross-section, flexible with ferrule with plastic sleeve	0.2 mm² ... 0.75 mm²	