

# PTCB E1 24DC/3A NO - Electronic circuit breaker



2909904

<https://www.phoenixcontact.com/us/products/2909904>

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1-channel, electronic circuit breaker for protecting loads at 24 V DC against overload and short circuit. Easy potential distribution with components from the CLIPLINE complete terminal block system. With fixed nominal current. For installation on DIN rails.



## Your advantages

- Simple application setup due to bridging option to CLIPLINE complete terminal block system
- More space in the control cabinet: narrowest protection on just 6 mm width
- Individual setup for suitable protection, exactly according to your requirements
- Optimum protection for cables and sensors as well as NEC Class 2 circuits by means of an additional internal output fuse

## Commercial data

Item number	2909904
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CL10
Product key	CLA135
GTIN	4055626408729
Weight per piece (including packing)	34.1 g
Weight per piece (excluding packing)	27.64 g
Customs tariff number	85363010
Country of origin	US

## Technical data

### Notes

#### General

Note	
	EN 50121-3-2: Railway applications - Electromagnetic compatibility - Part 3-2: Rolling stock – Apparatus
	Connection for signal line tested in accordance with EN 61000-4-4 with 1 kV; if necessary, customer must provide appropriate protective measures
	Repeated hard short circuits can reduce the melting integral of the integrated backup fuse.
	Always connect the negative pole to terminal IN- to ensure the internal power supply. Return currents from the loads must not be fed back to the power supply via IN- of the circuit breaker.

### Product properties

Product type	Device circuit breakers
Product family	PTCB
Type	DIN rail module, one-piece
Number of positions	1
No. of channels	1

#### Insulation characteristics

Protection class	III
Pollution degree	2

### Electrical properties

#### General

Operating voltage	18 V DC ... 27.5 V DC
Rated voltage	24 V DC
Rated current $I_N$	24 A (Total current input)
	3 A (Rated current output)
Rated current (pre-adjusted)	3 A
Rated surge voltage	0.5 kV
Tripping method	E (electronic)
Feedback resistance	max. 35 V DC
Required backup fuse	Only required if $I_{max}$ of the power supply > the short-circuit switching capacity. Integrated failsafe element.
Short-circuit switching capacity	300 A
Dielectric strength	max. 35 V DC (Load circuit)
Fuse	electronic
Efficiency	> 99 %
Closed circuit current $I_0$	typ. 12 mA
Power dissipation	typ. 0.3 W (No-load operation)
	< 0.9 W (Nominal operation)

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Module initialization time	< 0.55 s
Waiting time after switch off of a channel	5 s (at overload / short circuit)
Measuring tolerance I	± 15 %
Temperature derating	21 A (Total current at 60°C) 24 A (Total current at 50°C) 3 A (Channel current at 60°C) 3 A (Channel current at 50°C)
MTBF (IEC 61709, SN 29500)	28571428 h (at 25 °C with 21 % load) 14084507 h (at 40°C with 34.25% load) 2053388 h (at 60°C with 100% load)
Voltage drop	0.06 V (at 2 A)
Fail-safe element	4 A DC
Contact switching type	without electrical isolation

## Load circuit

Shutdown time	≤ 10 ms (for short circuit > 2.0 x I <sub>N</sub> ) 1 s (1.2 ... 2.0 x I <sub>N</sub> )
Undervoltage switch-off	≤ 17.8 V DC (active) ≥ 18.8 V DC (inactive)
Overvoltage switch-off	≥ 27.5 V DC (active) ≤ 27 V DC (inactive)
Max. capacitive load	14000 µF (Depending on the available short-circuit current)

## Indicator/remote signaling

Connection name	Remote indication circuit
Switching function	N/O contact
Operating voltage	0 V DC ... 30 V DC
Operating current	100 mA DC

## Connection data

### Main circuit IN+

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

### Main circuit IN-

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>

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Conductor cross-section AWG	24 ... 12
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

## Main circuit OUT

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 12
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

## Remote indication circuit

Connection method	Push-in connection
Stripping length	8 mm
Conductor cross-section flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>
Conductor cross-section AWG	24 ... 14
Conductor cross-section, flexible, with ferrule, with plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
Conductor cross-section, flexible, with ferrule, without plastic sleeve	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>

## Signaling

Channel LED off	off (Channel switched off)
Channel LED yellow	lit (Channel switched on, channel load > 80%)
	flashing (Programming mode active)
Channel LED green	lit (Channel switched on)
Channel LED red	lit (Channel switched off, over- or undervoltage active)
	ON temporarily (Channel switched off, 5 s cool-down phase, overload or short-circuit release)
	flashing (Channel switched off, ready to be switched back on, overload or short-circuit release)
	flashing quickly (Channel switched off, external voltage at the output, possible installation error)

## Dimensions

Dimensional drawing	
Width	6.2 mm
Height	105.8 mm
Depth	55.6 mm (incl. DIN rail 7.5 mm)

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## Material specifications

Color	gray (RAL 7042)
Material	PBT
	PBT
Flammability rating according to UL 94	V-0

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-30 °C ... 60 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Altitude	≤ 3000 m up to 52 °C (amsl)
	≤ 4000 m up to 46 °C (amsl)
Humidity test	96 h, 95 % RH, 40 °C
Shock (operation)	30g (IEC 60068-2-27, Test Ea)
Vibration (operation)	10 Hz ... 59.6 Hz (Amplitude ±0.35 mm; in accordance with IEC 60068-2-6, Test Fc)
	59.6 Hz ... 150 Hz (Acceleration 5g; in accordance with IEC 60068-2-6, Test Fc)
	5 Hz ... 100 Hz (Resonance search 4g; resonance frequency 4g; 90 min in accordance with DNV GL Class B)

## Approvals

### UL approval

Identification	UL/C-UL Listed UL 508
	UL Recognized UL 2367
	NEC Class 2 according to UL 1310
	UL/C-UL Listed ANSI/UL 121201 Class I, Division 2, Groups A, B, C, D; T4 (Hazardous Location)

### Shipbuilding approval

Identification	DNV GL
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### Corrosive gas test

Identification	ISA S71.04.2013 G3 Harsh Group A
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### Shipbuilding data

Temperature	D
Humidity	B
Vibration	B
EMC	B
Enclosure	A

## Standards and regulations

Standards/specifications	EN 61000-6-2
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Note	EMC – Immunity for industrial areas
Standards/specifications	EN 61000-6-3
Note	EMC – Emission for residential, business and commercial properties and small operations
Standards/specifications	EN 60068-2-78
Note	Environmental influences – Moisture and heat, constant
Standards/specifications	EN 50178
Note	Equipping power installations with electronic equipment
Standards/specifications	EN 60068-2-6
Note	Environmental influences – Vibrations (sinusoidal)
Standards/specifications	EN 60068-2-27
Note	Environmental influences – Shocks
Standards/specifications	EN 60068-2-30
Note	Environmental influences – Part 2–30: Tests – Test Db: Damp heat, cyclical
Standards/specifications	EN 61373
Note	Railway applications - Rolling stock equipment - Shock and vibration tests
Standards/specifications	EN 45545-2
Note	Railway applications - Fire protection on railway vehicles - Part 2: Requirements for fire behavior of materials and components

## Mounting

Mounting type	DIN rail: 35 mm
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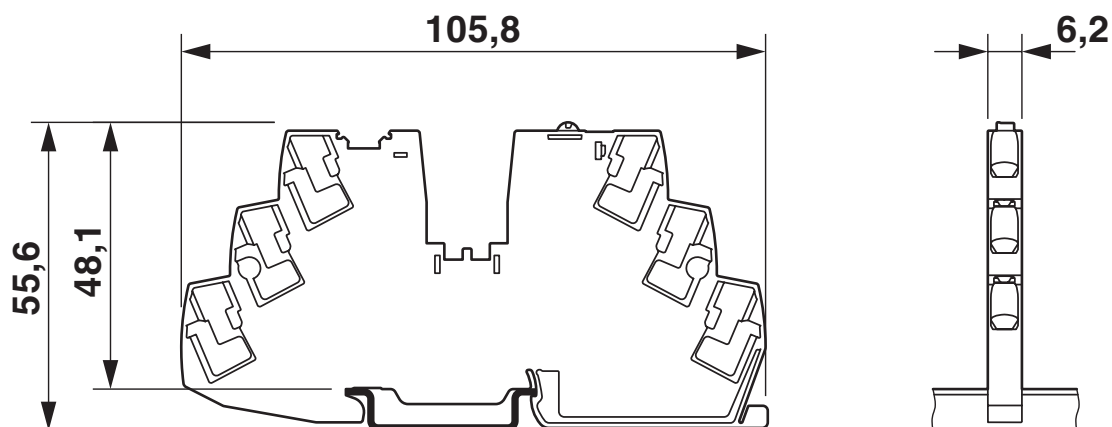
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## Drawings

Dimensional drawing



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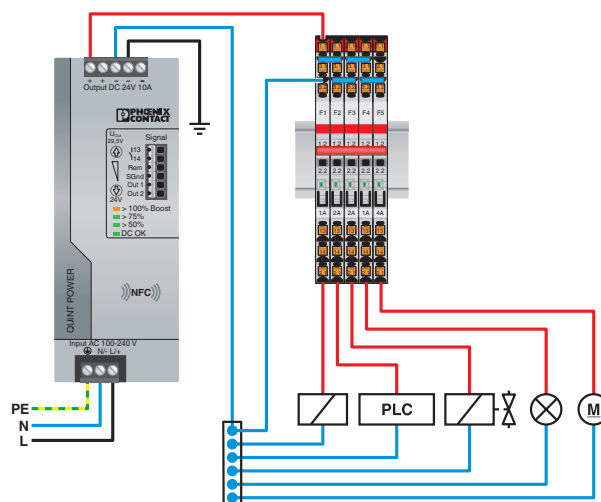
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Product drawing



Application drawing



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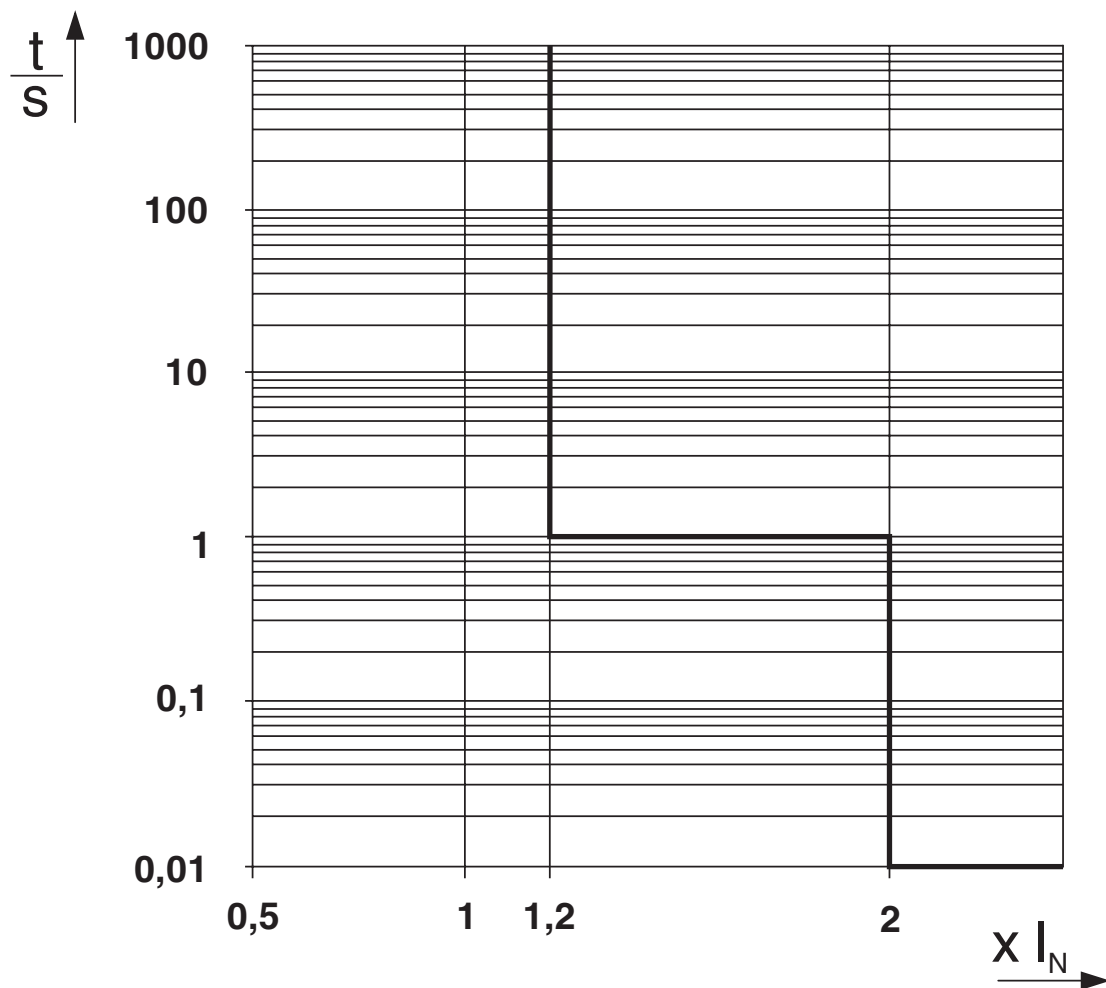
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Application drawing



Diagram



Trigger characteristic in the DC range

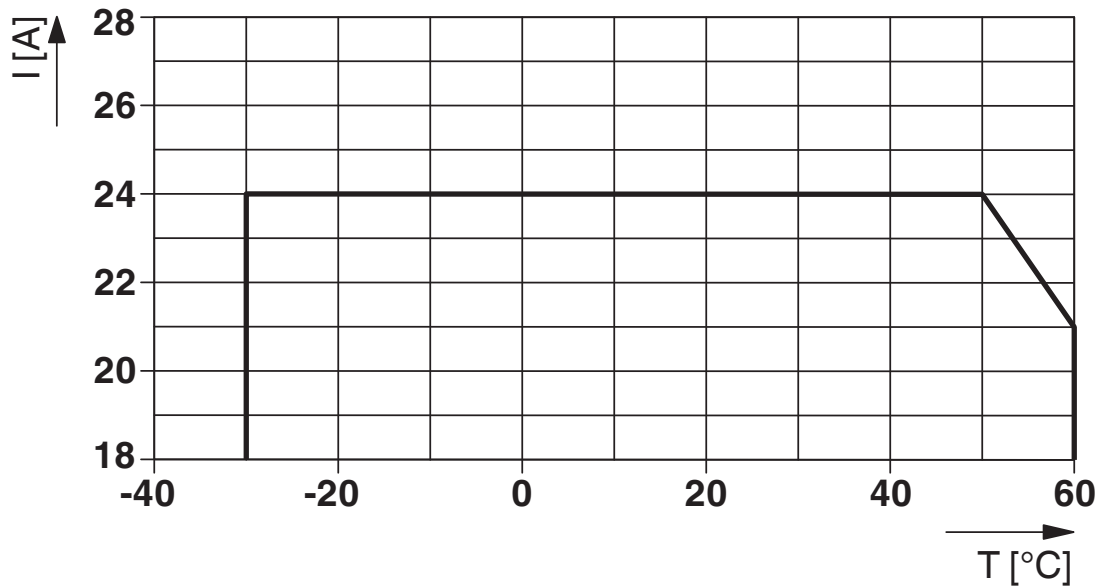
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Diagram



Total current input

Block diagram



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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2909904>



**UL Recognized**

Approval ID: E317172-20170817



**DNV GL**

Approval ID: TAE00003UT



**UL Listed**

Approval ID: E123528-20170530



**cUL Listed**

Approval ID: E123528-20170530



**UL Recognized**

Approval ID: E324415-20201030



**cUL Listed**

Approval ID: E483407-20201030



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## Classifications

### ECLASS

ECLASS-13.0	27140401
ECLASS-15.0	27140401

### ETIM

ETIM 10.0	EC003538
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### UNSPSC

UNSPSC 21.0	39121400
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	7(a), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-50
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
SCIP	47d58b81-3fef-4339-b0c8-a62d8480c6e1

### EF3.1 Climate Change

CO2e kg	1.06 kg CO2e
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