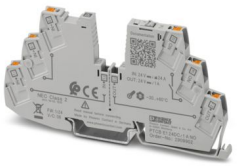
# PTCB E1 24DC/1A NO - Electronic circuit breaker

2909902

https://www.phoenixcontact.com/us/products/2909902

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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

ELEKTROGERÄTE RÜCKNAHME

## Commercial data

| | |
|---|---|
| Item number | 2909902 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | CL10 |
| Product key | CLA135 |
| GTIN | 4055626408705 |
| 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 ... 30 V DC |
| Rated voltage | 24 V DC |
| Rated current $I_N$ | 24 A (Total current input) |
| | 1 A (Rated current output) |
| Rated current (pre-adjusted) | 1 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) |
| | < 0.8 W (Nominal operation) |

| | |
|---|---|
| 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) |
| | 1 A (Channel current at 60°C) |
| | 1 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 $I_N$) |
| | 1 s (1.2 ... 2.0 x $I_N$) |
| Undervoltage switch-off | ≤ 17.8 V DC (active) |
| | ≥ 18.8 V DC (inactive) |
| Overvoltage switch-off | ≥ 30.5 V DC (active) |
| | ≤ 29.5 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 mm² ... 2.5 mm² |
| Conductor cross-section rigid | 0.2 mm² ... 4 mm² |
| Conductor cross-section AWG | 24 ... 12 |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.2 mm² ... 2.5 mm² |

Main circuit IN-

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 8 mm |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section rigid | 0.2 mm² ... 4 mm² |

| | |
|---|---|
| Conductor cross-section AWG | 24 ... 12 |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.2 mm² ... 2.5 mm² |

Main circuit OUT

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 8 mm |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section rigid | 0.2 mm² ... 4 mm² |
| Conductor cross-section AWG | 24 ... 12 |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.2 mm² ... 2.5 mm² |

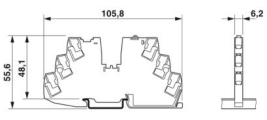
Remote indication circuit

| | |
|---|---|
| Connection method | Push-in connection |
| Stripping length | 8 mm |
| Conductor cross-section flexible | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section rigid | 0.2 mm² ... 4 mm² |
| Conductor cross-section AWG | 24 ... 14 |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.2 mm² ... 2.5 mm² |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.2 mm² ... 2.5 mm² |

## 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) |

## 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 |

Corrosive gas test

| | |
|---|---|
| Identification | ISA S71.04.2013 G3 Harsh Group A |

Shipbuilding data

| | |
|---|---|
| Temperature | D |
| Humidity | B |
| Vibration | B |
| EMC | B |
| Enclosure | A |

## Standards and regulations

| | |
|---|---|
| Standards/specifications | EN 61000-6-2 |

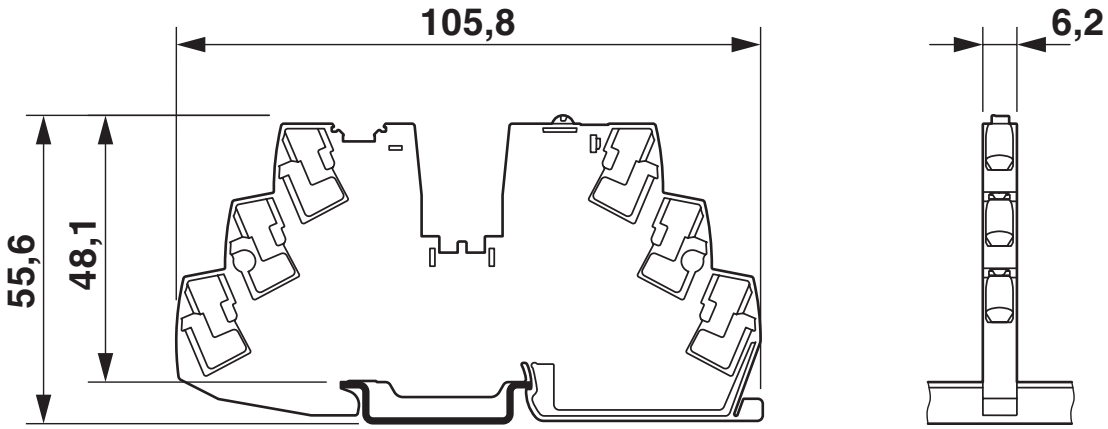
| | |
|---|---|
| Note | EMC – Immunity for industrial areas |
| Standards/specifications | EN 61000-6-3 |
| Note | EMC – Emission for residential, business and commercial properties and small operations |
| Standards/specifications | EN 60068-2-78 |
| Note | Environmental influences – Moisture and heat, 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

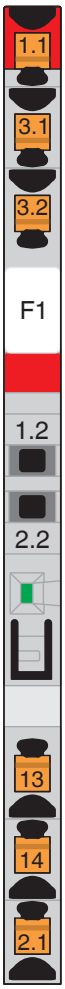
| | |
|---|---|
| Mounting type | DIN rail: 35 mm |

## Drawings

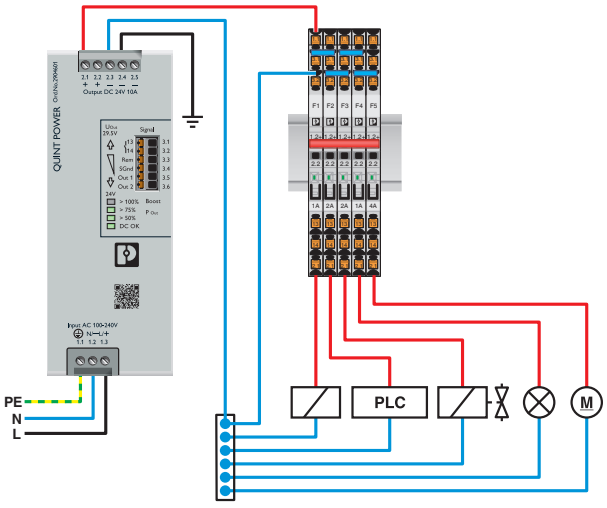
Dimensional drawing



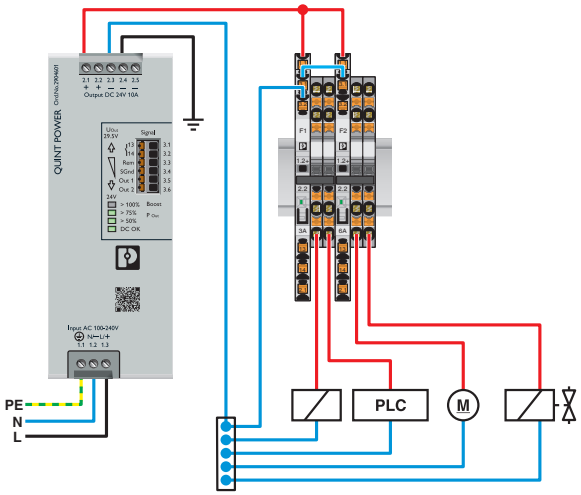
Product drawing



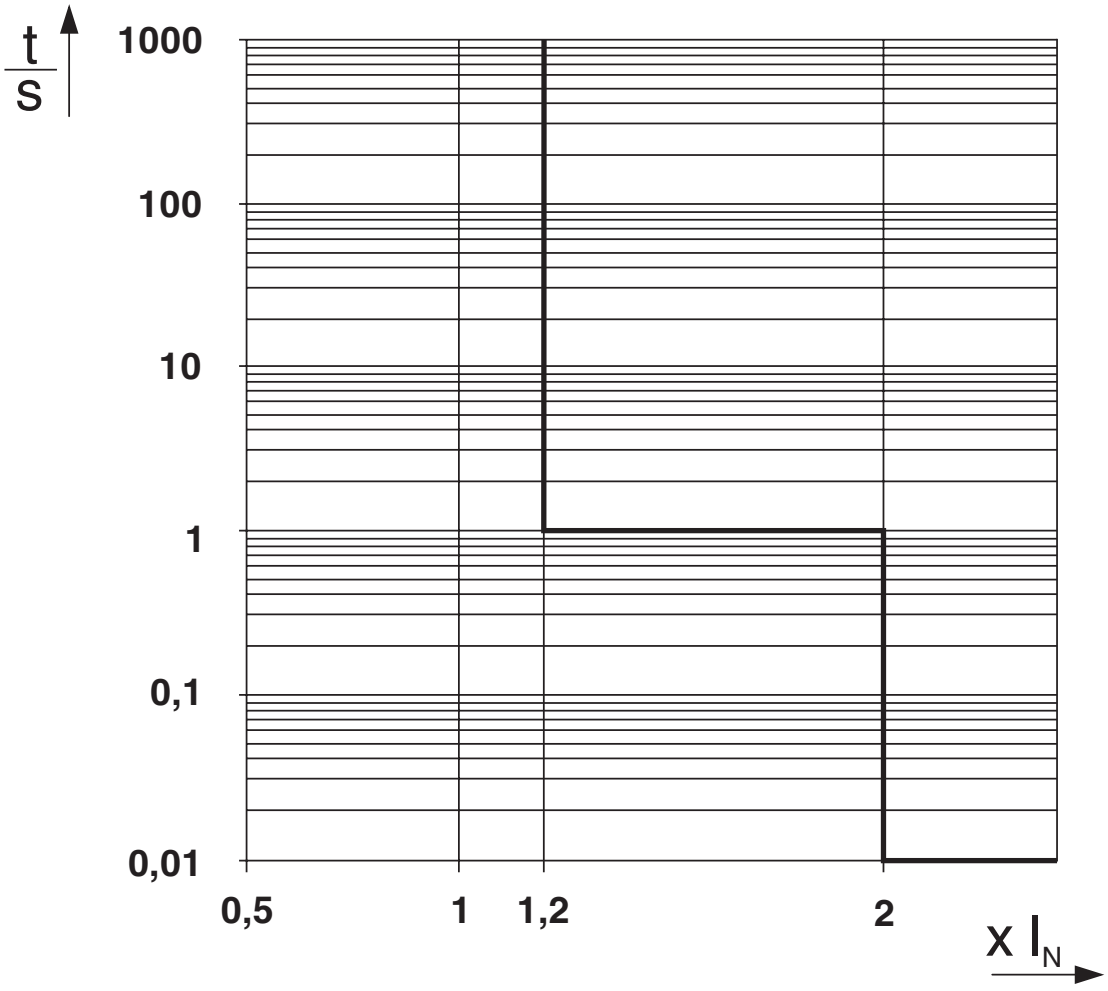

Application drawing



Application drawing

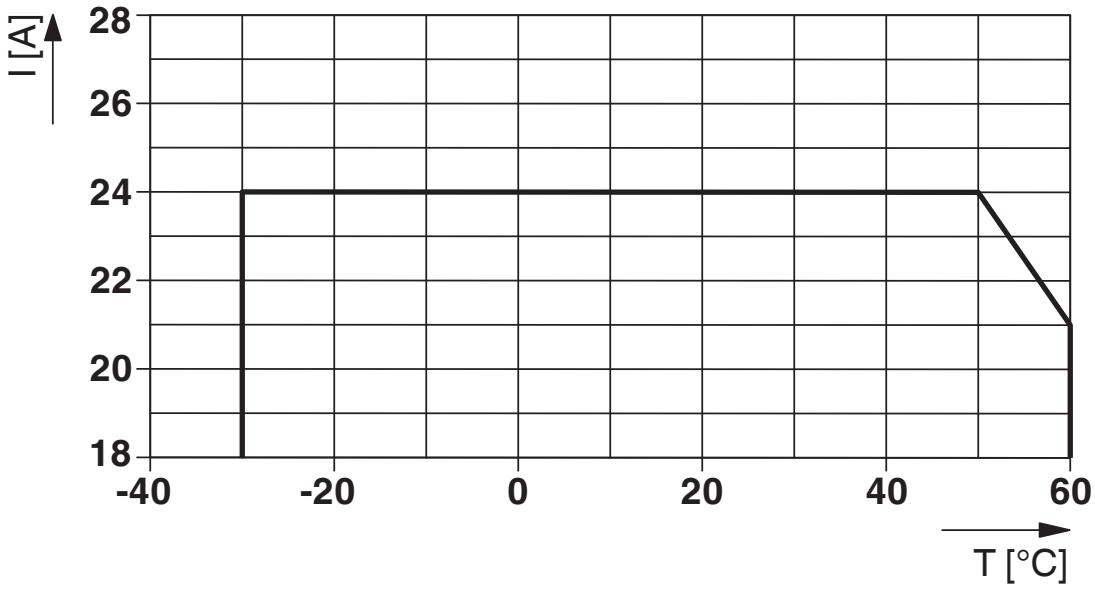



Diagram



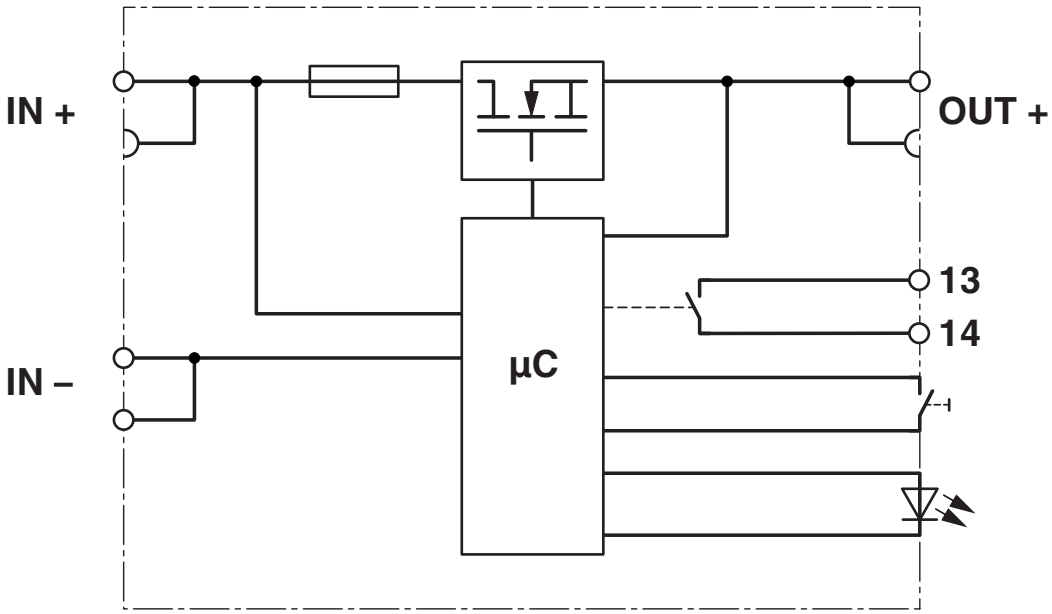

Trigger characteristic in the DC range

Diagram




Total current input

Block diagram



## Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/us/products/2909902

**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

**UL Listed**
Approval ID: E483407-20201030

## Classifications

### ECLASS

| | |
|---|---|
| ECLASS-13.0 | 27140401 |
| ECLASS-15.0 | 27140401 |

### ETIM

| | |
|---|---|
| ETIM 10.0 | EC003538 |

### UNSPSC

| | |
|---|---|
| UNSPSC 21.0 | 39121400 |

## 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 | edbfffdc-2758-4139-9eea-aaa0ad46a27b |

EF3.1 Climate Change

| | |
|---|---|
| CO2e kg | 1.538 kg CO2e |

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