

# PTCB E1 24DC/1-4A SI-R - Electronic circuit breaker



1135753

<https://www.phoenixcontact.com/us/products/1135753>

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1-channel, electronic fuse for protecting 24 V loads. Easy potential distribution with terminal blocks from the CLIPLINE complete system. With status output, reset input, and electronic interlock. 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
- Flexible use and reduction of inventory due to adjustable amp values on each device for wide range of applications
- Enhanced diagnostic and control options, thanks to integrated status output and reset input
- 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                          | 1135753       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL10          |
| Product key                          | CLA135        |
| GTIN                                 | 4063151069759 |
| Weight per piece (including packing) | 33.7 g        |
| Weight per piece (excluding packing) | 27.5 g        |
| Customs tariff number                | 85363010      |
| Country of origin                    | DE            |

## 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.  |

### Product properties

|                     |                            |
|---------------------|----------------------------|
| Product type        | Device circuit breakers    |
| Product family      | PTCB                       |
| Type                | DIN rail module, one-piece |
| Number of positions | 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)  |
|  | 4 A (Rated current output)  |
| Rated current $I_N$                        | 1 / 2 / 3 / 4 A DC (adjustable)   |
| Rated current (pre-adjusted)               | 4 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. 8 mA   |
| Power dissipation                          | typ. 0.15 W (No-load operation)   |
|  | < 1.1 W (Nominal operation)   |
| Module initialization time                 | < 0.55 s  |
| Waiting time after switch off of a channel | 5 s (at overload / short circuit)   |

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|                            |                                       |
|----------------------------|---------------------------------------|
| Measuring tolerance I      | ± 15 %                                |
| Temperature derating       | 21 A (Total current at 60°C)          |
|                            | 24 A (Total current at 50°C)          |
|                            | 4 A (Channel current at 60°C)         |
|                            | 4 A (Channel current at 50°C)         |
| MTBF (IEC 61709, SN 29500) | 27027027 h (at 25 °C with 21 % load)  |
|                            | 13157894 h (at 40°C with 34.25% load) |
|                            | 1960784 h (at 60°C with 100% load)    |
| Voltage drop               | 0.13 V (at 4 A)                       |
| Fail-safe element          | 5 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    | 15000 µF (Depending on the current setting and the short-circuit current available) |

## Reset

|   |  |
|---|--|
| Input voltage range   | 7 V DC ... 30 V DC (Reset with falling edge) |
| Current consumption   | typ. 0.4 mA (at 24 V DC)                     |
| Pulse length  | ≥ 50 ms (High)                               |
|   | ≥ 50 ms (Low)                                |
| Voltage   | < 5 V DC (Low state)                         |
|   | > 8 V DC (High state)                        |
| Stripping length  | 8 mm   |
| Conductor cross-section rigid   | 0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>  |
| Conductor cross-section AWG   | 24 ... 12                                    |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve    | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |

## Status output

|   |  |
|---|--|
| Output voltage  | 24 V DC (Error)                              |
|   | 0 V DC (no error)                            |
| Output current  | max. 0.015 A (Short-circuit-proof)           |
| Stripping length  | 8 mm   |
| 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    | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> |

## 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> |
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### 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 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> |

## 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) |

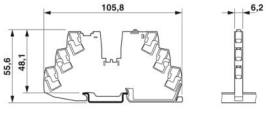
## Dimensions

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|                     |  |
|---------------------|--|
| 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)<br>≤ 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)<br>59.6 Hz ... 150 Hz (Acceleration 5g; in accordance with IEC 60068-2-6, Test Fc)<br>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<br>UL Recognized UL 2367<br>NEC Class 2 according to UL 1310<br>UL/C-UL Listed ANSI/UL 121201 Class I, Division 2, Groups A, B, C, D; T4 (Hazardous Location) |
|----------------|---|

### DNV GL

|                |                       |
|----------------|-----------------------|
| Identification | Shipbuilding approval |
|----------------|-----------------------|

### Corrosive gas test

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

### Shipbuilding data

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|             |   |
|-------------|---|
| 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 |
|---------------|-----------------|

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## Drawings

Dimensional drawing

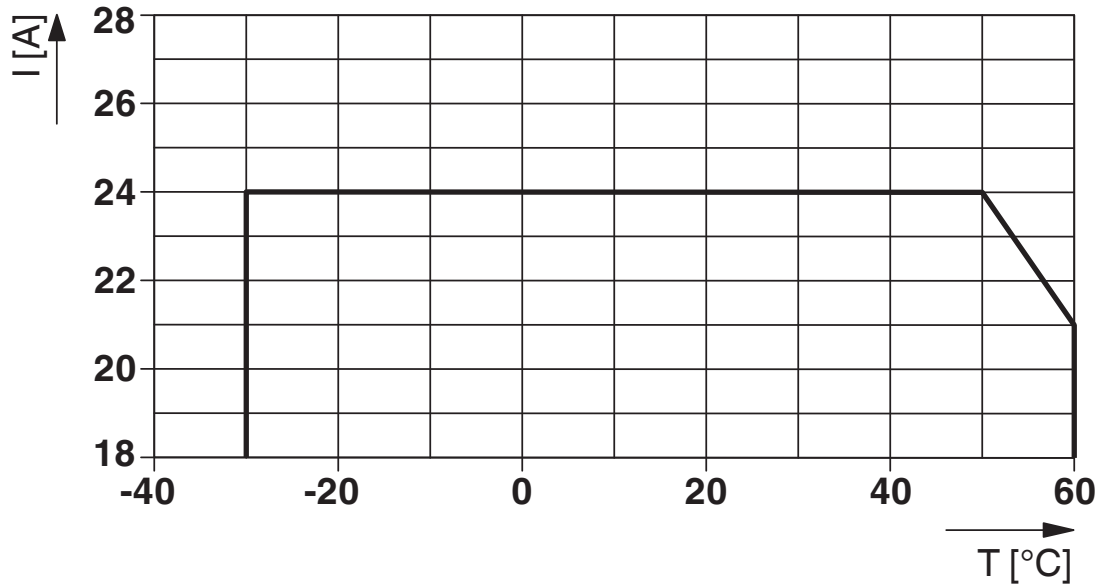


Diagram



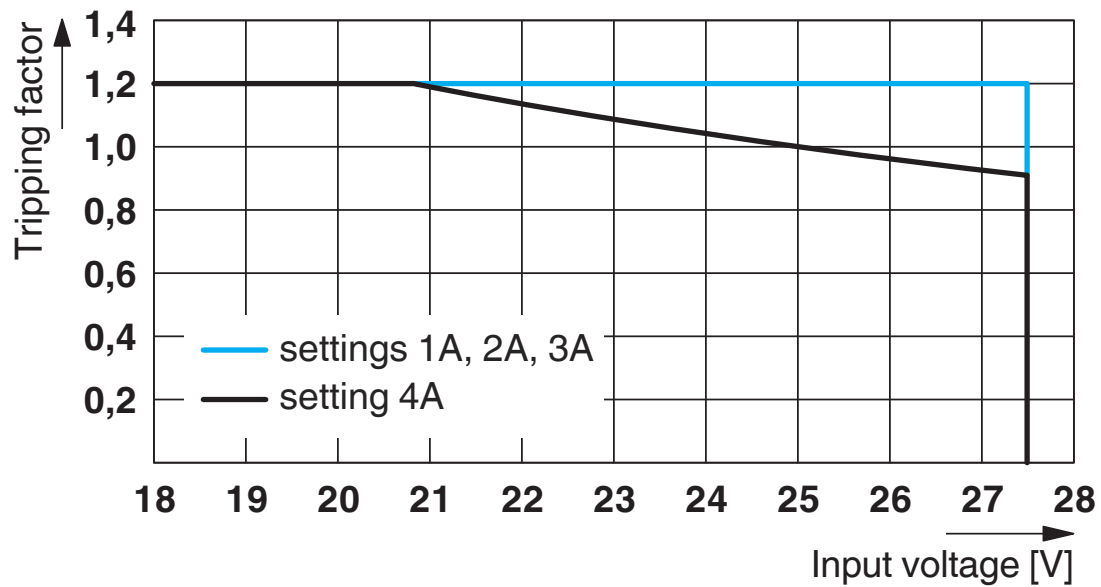
Trigger characteristic in the DC range

Diagram



Total current input

Diagram



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Block diagram



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## Approvals

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**UL Recognized**

Approval ID: FILE E 317172



**DNV GL**

Approval ID: TAE00003UT



**UL Listed**

Approval ID: E123528



**cUL Listed**

Approval ID: E123528



**UL Recognized**

Approval ID: E324415-20201030



**cUL Listed**

Approval ID: E483407-20201030



**UL Listed**

Approval ID: E483407-20201030

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## Classifications

### ECLASS

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

### ETIM

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

### 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                                | ec87bc8b-22f2-4343-825f-4efc259ccd5b |

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 0.837 kg CO2e |
|---------|---------------|

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