

# CBM E8 24DC/0.5-10A NO-R - Electronic circuit breaker



2905744

<https://www.phoenixcontact.com/us/products/2905744>

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Multi-channel, electronic circuit breaker with active current limitation for protecting eight loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.

## Your advantages

- Easy to configure, thanks to the nominal current assistant
- Active current limitation to improve the capacity of the upstream power supply
- Adjustable in increments per channel:  
from 0.5 A to 10 A
- Easy system monitoring with early signaling and direct pickup of information at the product
- Increased system availability with intelligent detection of under- and overvoltage



## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2905744       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | CL13          |
| Product key                          | CLA151        |
| GTIN                                 | 4046356992367 |
| Weight per piece (including packing) | 284.4 g       |
| Weight per piece (excluding packing) | 284.4 g       |
| Customs tariff number                | 85362010      |
| Country of origin                    | DE            |

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## Technical data

### Notes

#### General

|      |                                                                                                                                                                                               |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Note | 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      | CBM                        |
| Type                | DIN rail module, one-piece |
| Number of positions | 1                          |
| No. of channels     | 8                          |

#### Insulation characteristics

|                  |     |
|------------------|-----|
| Protection class | III |
| Pollution degree | 2   |

### Electrical properties

#### General

|                                            |                                                                                                                     |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Operating voltage                          | 16.5 V DC ... 30 V DC                                                                                               |
| Rated voltage                              | 24 V DC                                                                                                             |
| Rated current $I_N$                        | max. 80 A (for double supply IN+ with at least 2 x 6 mm <sup>2</sup> )                                              |
| Rated current $I_N$                        | 0.5 / 1 / 2 / 4 / 6 / 10 A DC (adjustable per output channel)                                                       |
| Rated current (pre-adjusted)               | 0.5 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. 30 V DC (Load circuit)                                                                                         |
| Active current limitation                  | typ. 2.0 x $I_N$ (0.5 - 1 A)<br>typ. 1.5 x $I_N$ (2 - 10 A)                                                         |
| Fuse                                       | electronic                                                                                                          |
| Efficiency                                 | > 99 %                                                                                                              |
| Closed circuit current $I_0$               | typ. 50 mA                                                                                                          |
| Power dissipation                          | 0.8 W (No-load operation)<br>13 W (Nominal operation)                                                               |
| Module initialization time                 | 2 s                                                                                                                 |
| Waiting time after switch off of a channel | 10 s (at overload / short circuit)                                                                                  |
| Measuring tolerance I                      | typ. 40 % (0.5 A ... 1 A)<br>typ. 10 % (2 A ... 10 A)                                                               |

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|                            |                                     |
|----------------------------|-------------------------------------|
| Temperature derating       | 40 A DC (at 70 °C)                  |
|                            | 50 A DC (at 60 °C)                  |
|                            | 60 A DC (at 50 °C)                  |
|                            | 80 A DC (at 40 °C)                  |
| MTBF (IEC 61709, SN 29500) | 1581841 h (at 25 °C with 21 % load) |
|                            | 633955 h (at 40°C with 34.25% load) |
|                            | 229044 h (at 40°C with 100% load)   |
| Fail-safe element          | 15 A DC (per output channel)        |
| Contact switching type     | without electrical isolation        |

## Load circuit

|                         |                                                              |
|-------------------------|--------------------------------------------------------------|
| Shutdown time           | typ. 0.02 s (0.005 s ... 0.05 s at $> 1.3 \times I_N$ )      |
|                         | typ. 30 s (29.5 s ... 30.5 s at $1.1 \dots 1.3 \times I_N$ ) |
| Undervoltage switch-off | $\leq 15.8 \text{ V DC (active)}$                            |
|                         | $\geq 16.5 \text{ V DC (inactive)}$                          |
| Overvoltage switch-off  | $\geq 30.5 \text{ V DC (active)}$                            |
|                         | $\leq 29.5 \text{ V DC (inactive)}$                          |
| Max. capacitive load    | 75000 $\mu\text{F}$                                          |
| Switch-on delay         | 0.1 s (per output channel)                                   |

## 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        | $\geq 50 \text{ ms (High signal)}$           |
|                     | $\geq 50 \text{ ms (Low signal)}$            |
| Voltage             | $< 5 \text{ V DC (Low signal)}$              |
|                     | $> 8 \text{ V DC (High signal)}$             |

## Status output

|                |                                                      |
|----------------|------------------------------------------------------|
| Output voltage | 24 V DC                                              |
| Output current | max. 20 mA (when $I > 80\%$ at at least one channel) |

## Indicator/remote signaling

|                    |                           |
|--------------------|---------------------------|
| Connection name    | Remote indication circuit |
| Switching function | N/O contact               |
| Operating voltage  | 0 V DC ... 30 V DC        |
| Operating current  | 1 mA DC ... 100 mA DC     |

## Connection data

### Main circuit IN+

|                                                                      |                                             |
|----------------------------------------------------------------------|---------------------------------------------|
| Connection method                                                    | Push-in connection                          |
| Stripping length                                                     | 18 mm                                       |
| Conductor cross-section rigid                                        | 0.75 mm <sup>2</sup> ... 16 mm <sup>2</sup> |
| Conductor cross-section AWG                                          | 20 ... 4                                    |
| Conductor cross-section, flexible, with ferrule, with plastic sleeve | 0.75 mm <sup>2</sup> ... 10 mm <sup>2</sup> |

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|                                                                         |                                             |
|-------------------------------------------------------------------------|---------------------------------------------|
| Conductor cross-section, flexible, with ferrule, without plastic sleeve | 0.75 mm <sup>2</sup> ... 16 mm <sup>2</sup> |
|-------------------------------------------------------------------------|---------------------------------------------|

## Main circuit IN-

|                                                                         |                                              |
|-------------------------------------------------------------------------|----------------------------------------------|
| Connection method                                                       | Push-in connection                           |
| Stripping length                                                        | 10 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> ... 1.5 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> |

## Main circuit OUT

|                                                                         |                                              |
|-------------------------------------------------------------------------|----------------------------------------------|
| Connection method                                                       | Push-in connection                           |
| Stripping length                                                        | 10 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> ... 1.5 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> |

## Remote indication circuit

|                                                                         |                                              |
|-------------------------------------------------------------------------|----------------------------------------------|
| Connection method                                                       | Push-in connection                           |
| Stripping length                                                        | 10 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> ... 1.5 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> |

## Signaling

|                          |                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------|
| DC OK LED off            | off (No supply voltage)                                                                                   |
| DC OK LED yellow         | lit (Undervoltage active, voltage ≤ 15.8 V, active channels switched off and channel LEDs are lit red)    |
|                          | flashing (Undervoltage switch-off inactive, device was in undervoltage switch-off)                        |
| DC OK LED green          | lit (Operating voltage in nominal range 16,5 ... 30 V)                                                    |
| DC OK LED red            | lit (Overvoltage switch-off active, voltage ≥ 30.5 V, channels switched off and channel LEDs are lit red) |
|                          | flashing (Overvoltage switch-off inactive, device was in overvoltage shutdown)                            |
| Channel LED off          | off (Channel switched off)                                                                                |
| Channel LED yellow       | lit (Channel switched on, channel load > 80% )                                                            |
| Channel LED yellow-green | flashing (Channel switched on, nominal current assistant active)                                          |
| Channel LED green        | lit (Channel switched on)                                                                                 |
|                          | flashing (Channel switched on, programming mode active)                                                   |
|                          | lit (Channel switched off, over- or undervoltage active)                                                  |

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|                        |                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------|
| Channel LED red        | ON temporarily (Channel switched off, 10 s cool-down phase, overload or short-circuit release)                       |
|                        | flashing (Channel switched off, ready to be switched back on, overload or short-circuit release)                     |
| Channel LED red-yellow | flashing (Channel switched on, overload mode, capacity approximately 110 ... 130% , shutdown after 30 s)             |
| Channel LED red-green  | flashing (Channel switched off, programming mode active, current adjustment after overload or short-circuit release) |

## Dimensions

|                     |                                |
|---------------------|--------------------------------|
| Dimensional drawing |                                |
| Width               | 41 mm                          |
| Height              | 130 mm                         |
| Depth               | 121 mm (incl. DIN rail 7.5 mm) |

## Material specifications

|                                        |                       |
|----------------------------------------|-----------------------|
| Color                                  | light gray (RAL 7035) |
|                                        | gray (RAL 7042)       |
| Material                               | PC                    |
|                                        | PA 6.6                |
|                                        | PC                    |
|                                        | PBT-FR17              |
|                                        | POM                   |
| Flammability rating according to UL 94 | V-0                   |

## Environmental and real-life conditions

### Ambient conditions

|                                         |                                                                                                                                                       |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Degree of protection                    | IP20                                                                                                                                                  |
| Ambient temperature (operation)         | -25 °C ... 70 °C (Startup at -40 °C type-tested)                                                                                                      |
| Ambient temperature (storage/transport) | -40 °C ... 80 °C                                                                                                                                      |
| Altitude                                | ≤ 6000 m (amsl)                                                                                                                                       |
| Humidity test                           | 240 h, 95 % RH, 40 °C                                                                                                                                 |
| Shock (operation)                       | 30g (IEC 60068-2-27, Test Ea)                                                                                                                         |
| Vibration (operation)                   | 5 Hz ... 24.9 Hz (Amplitude ±1.6 mm; in accordance with IEC 60068-2-6, Test Fc)                                                                       |
|                                         | 24.9 Hz ... 150 Hz (Acceleration 4g; in accordance with IEC 60068-2-6, Test Fc with additional resonance frequency testing in accordance with DNV GL) |

## Approvals

# CBM E8 24DC/0.5-10A NO-R - Electronic circuit breaker



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## UL approval

|                |                                                                                  |
|----------------|----------------------------------------------------------------------------------|
| Identification | UL/C-UL Listed UL 508                                                            |
|                | UL Recognized UL 2367                                                            |
|                | UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D (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         | A                                                                                       |
| Enclosure   | Required protection according to the Rules shall be provided upon installation on board |

## Standards and regulations

|                          |                                                                                                                                  |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Standards/specifications | EN/IEC 61000-6-2                                                                                                                 |
| Note                     | EMC – Immunity for industrial areas                                                                                              |
| Standards/specifications | EN/IEC 61000-6-3                                                                                                                 |
| Note                     | EMC – Emission for residential, business and commercial properties and small operations                                          |
| Standards/specifications | EN/IEC 61000-6-8                                                                                                                 |
| Note                     | EMC interference emission for professional devices that are used in business and commercial areas as well as in small businesses |
| Standards/specifications | IEC 60068-2-6                                                                                                                    |
| Note                     | Environmental influences – Vibrations (sinusoidal)                                                                               |
| Standards/specifications | IEC 60068-2-1                                                                                                                    |
| Note                     | Environmental influences – Part 2-1: Tests – Test A: Cold                                                                        |
| Standards/specifications | IEC 60068-2-2                                                                                                                    |
| Note                     | Environmental influences – Part 2-2: Tests – Test B: Dry heat                                                                    |
| Standards/specifications | IEC 60068-2-78                                                                                                                   |
| Note                     | Environmental influences – Moisture and heat, constant                                                                           |
| Standards/specifications | IEC 60068-2-30                                                                                                                   |
| Note                     | Environmental influences – Part 2-30: Tests – Test Db: Damp heat, cyclical                                                       |

## Mounting

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

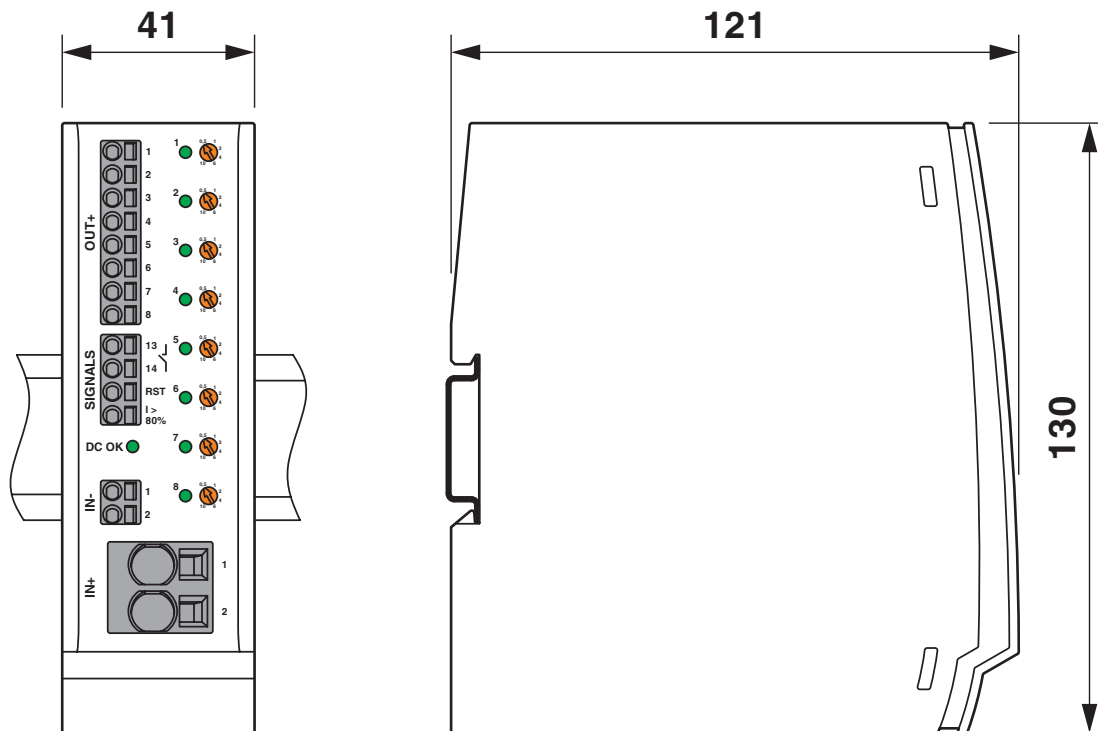
# CBM E8 24DC/0.5-10A NO-R - Electronic circuit breaker

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## Drawings

Dimensional drawing

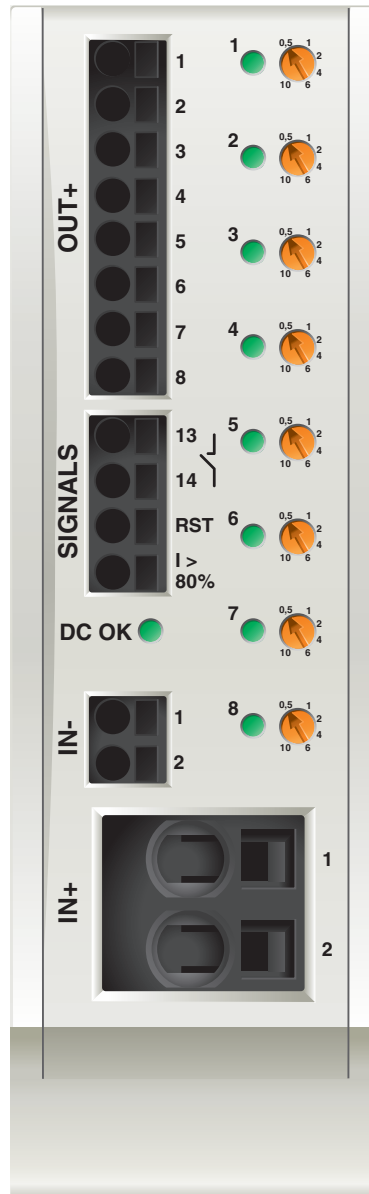


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Product drawing





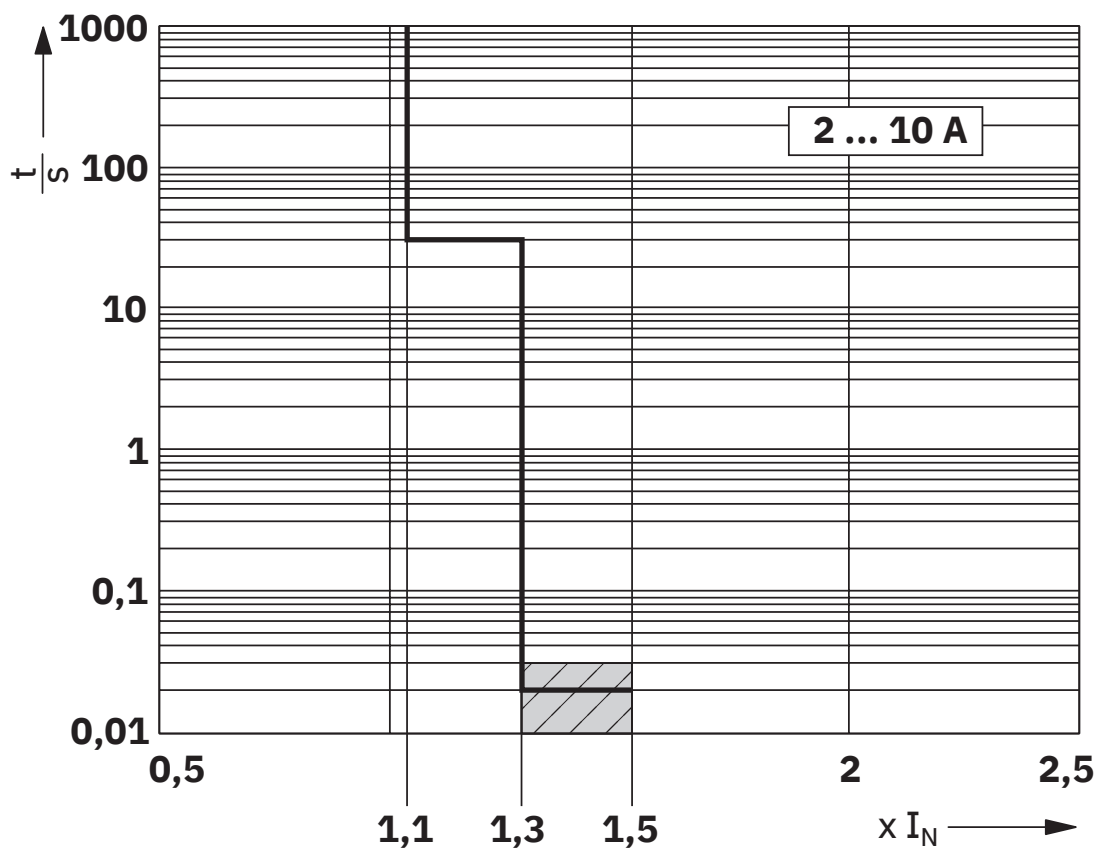
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Diagram



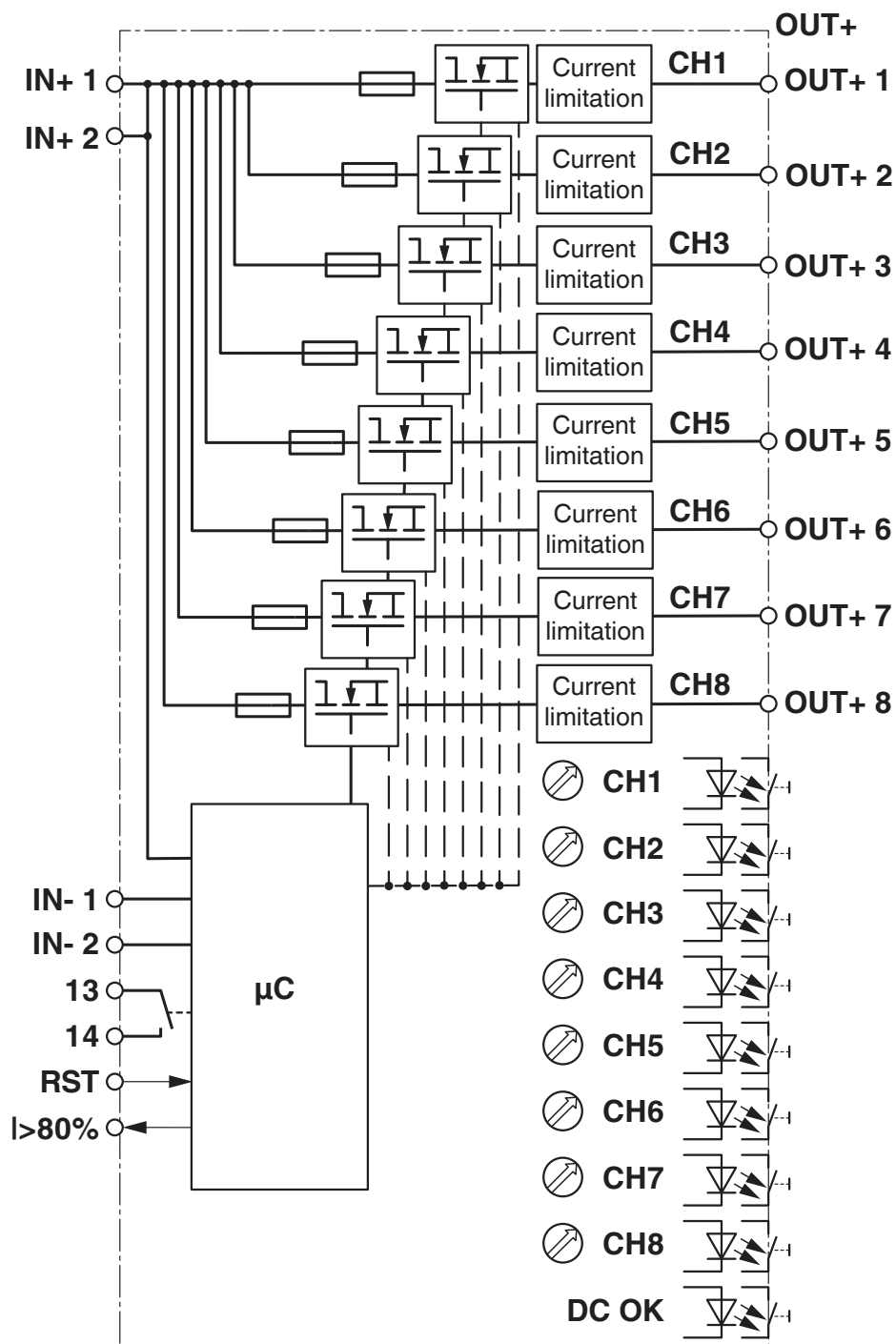
Trigger characteristic in the DC range

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Block diagram



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## Approvals

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**UL Recognized**

Approval ID: E317172



**DNV GL**

Approval ID: TAA00000U2



**UL Listed**

Approval ID: E123528



**cUL Listed**

Approval ID: E123528



**UL Recognized**

Approval ID: E324415



**cUL Listed**

Approval ID: E483407



**UL Listed**

Approval ID: E483407

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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                               | 34, 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)                                         |
|                                     | Perfluorobutane sulfonic acid (PFBS) and its salts(CAS: n/a) |
| SCIP                                | 3eb6a9fc-0de7-4d5f-af02-ec25c9a53840                         |

### EF3.1 Climate Change

|         |               |
|---------|---------------|
| CO2e kg | 6.165 kg CO2e |
|---------|---------------|

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