specter
ELECTRONIC CIRCUIT BREAKER

CBM E4 24DC/0.5-10A NO-R

Multi-channel, electronic circuit breaker with active current limitation for protecting four 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.

- 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

TECHNICAL DATA

PRODUCT PROPERTIES

Product type	Device circuit breakers
Product family	CBM
Type	DIN rail module, one-piece
Number of positions	1
No. of channels	4

DATA MANAGEMENT STATUS

Article revision	25

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 IN	max. 40 A DC
Rated current IN	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

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Tripping method	E (electronic)
Feedback resistance	max. 35 V DC
Required backup fuse	Only required if Imax 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 IN (0.5 - 1 A)
	typ. 1.5 x IN (2 - 10 A)
Fuse	electronic
Efficiency	> 99 %
Closed circuit current I_0	typ. 42 mA
Power dissipation	1 W (No-load operation)
	9 W (Nominal operation)
Module initialization time	3.3 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)
	typ. 10 % (2 A ... 10 A)
Temperature derating	40 A DC (at 70°C (65°C for UL 2367))
MTBF (IEC 61709, SN 29500)	2001962 h (at 25 °C)
	1292135 h (at 40 °C)
	653352 h (at 60 °C)
Fail-safe element	15 A DC (per output channel)

LOAD CIRCUIT

Shutdown time	0.02 s (> 1.3 x IN)
	30 s (1.1 ... 1.3 x IN)
Undervoltage switch-off	< 17.8 V DC (active)
	> 19 V DC (inactive)
Overvoltage switch-off	> 30.5 V DC (active)
	< 29.5 V DC (inactive)
Max. capacitive load	75000 µF (per channel at 24 V DC)
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	> 50 ms (High signal)
	> 50 ms (Low signal)
Voltage	< 5 V DC (Low signal)
	> 8 V DC (High signal)

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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 mm² ... 16 mm²
Conductor cross section AWG	20 ... 4
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.75 mm² ... 10 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.75 mm² ... 16 mm²

MAIN CIRCUIT IN-

Connection method	Push-in connection
Stripping length	10 mm
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 12
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.25 mm² ... 1.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm² ... 2.5 mm²

MAIN CIRCUIT OUT

Connection method	Push-in connection
Stripping length	10 mm
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section AWG	24 ... 12
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.25 mm² ... 1.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm² ... 2.5 mm²

REMOTE INDICATION CIRCUIT

Connection method	Push-in connection
Stripping length	10 mm
Conductor cross section rigid	0.2 mm² ... 2.5 mm²
Conductor cross section	AWG 24 ... 12
Conductor cross section, flexible, with ferrule, with plastic sleeve	0.25 mm² ... 1.5 mm²
Conductor cross section flexible, with ferrule without plastic sleeve	0.25 mm² ... 2.5 mm²

SIGNALING

DC OK LED off	off (No supply voltage)
DC OK LED yellow	lit (Undervoltage active, voltage < 17.8 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 18 ... 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)
Channel LED red	lit (Channel switched off, over- or undervoltage active)
	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)

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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) -25 °C ... 65 °C (for UL 2367)
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)

MOUNTING

Mounting type	DIN rail: 35 mm

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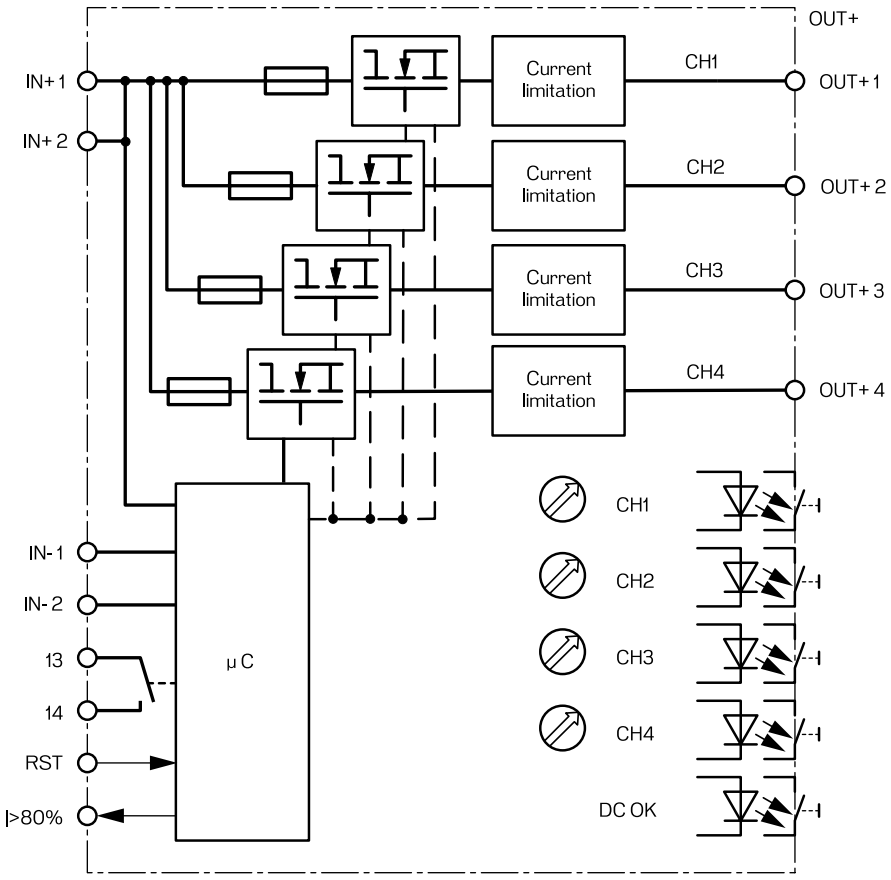
Block diagram



Application drawing

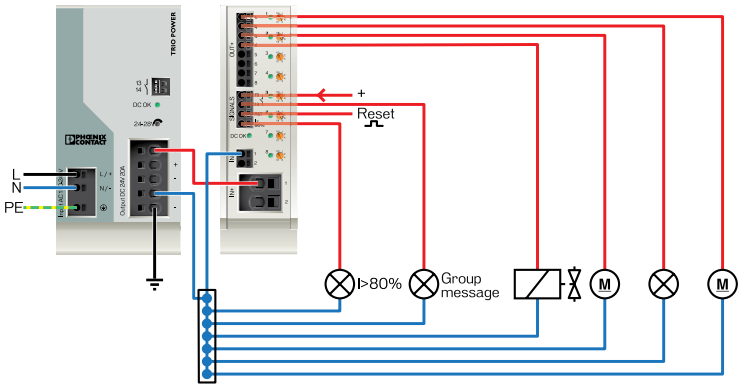


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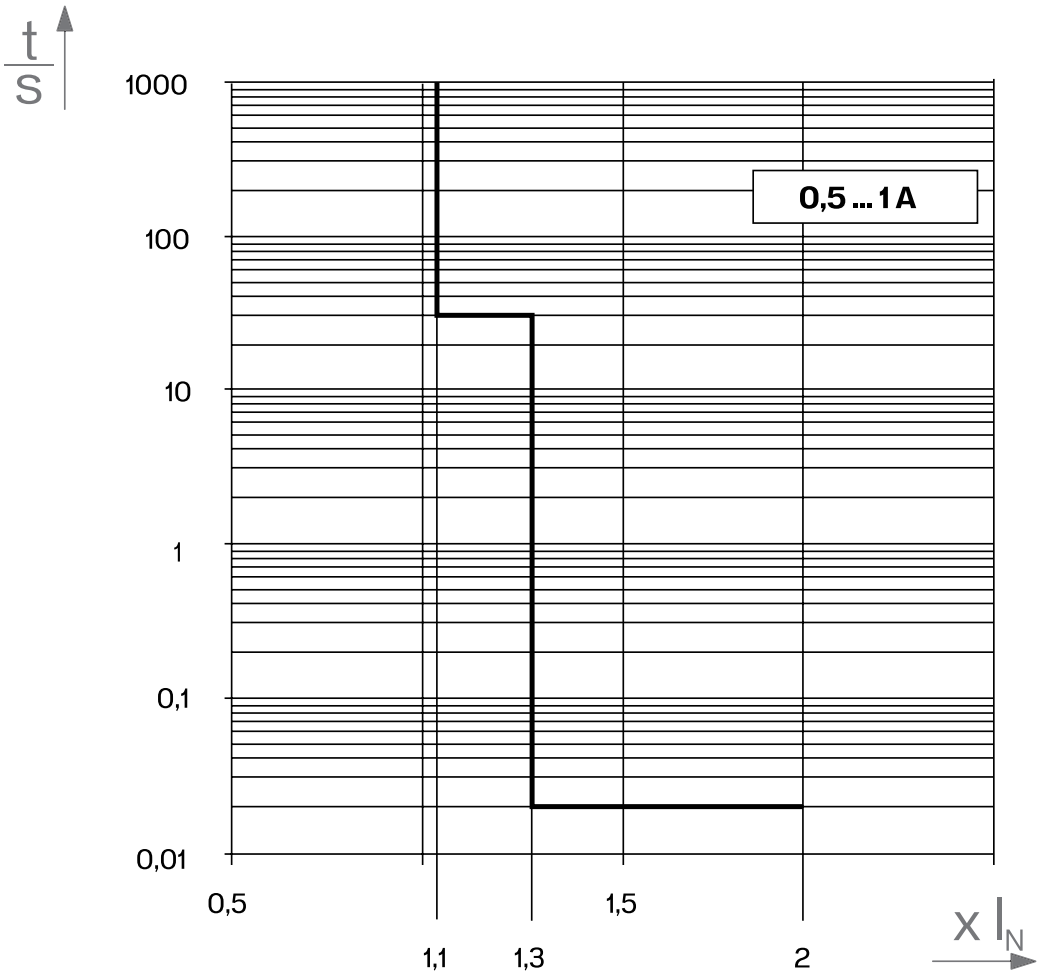
Diagram



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Dimensional drawing

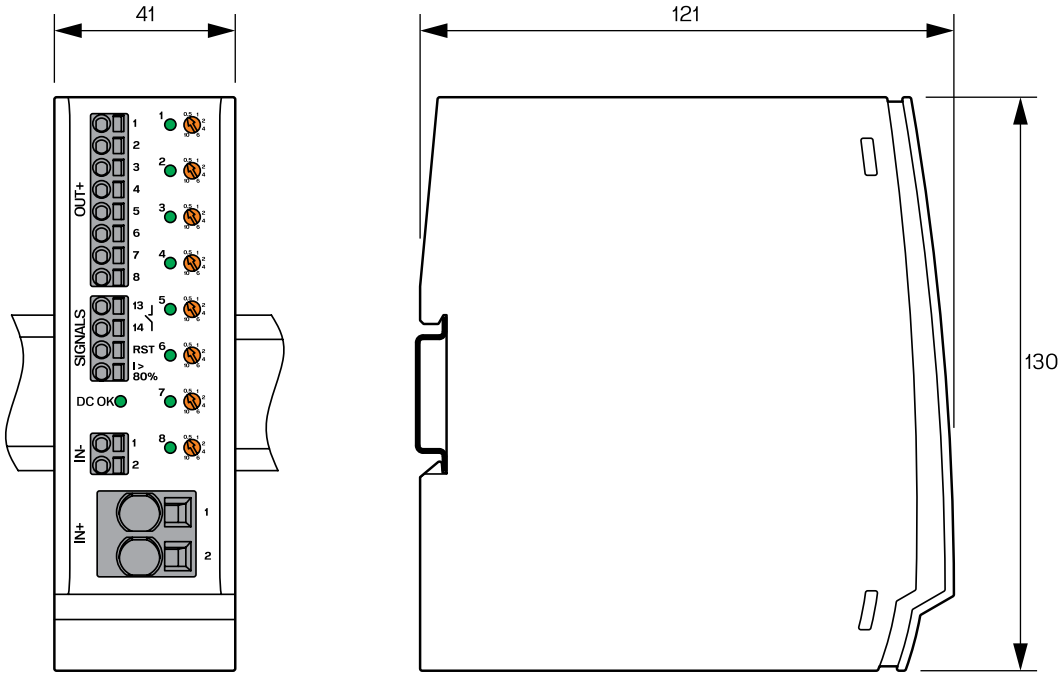

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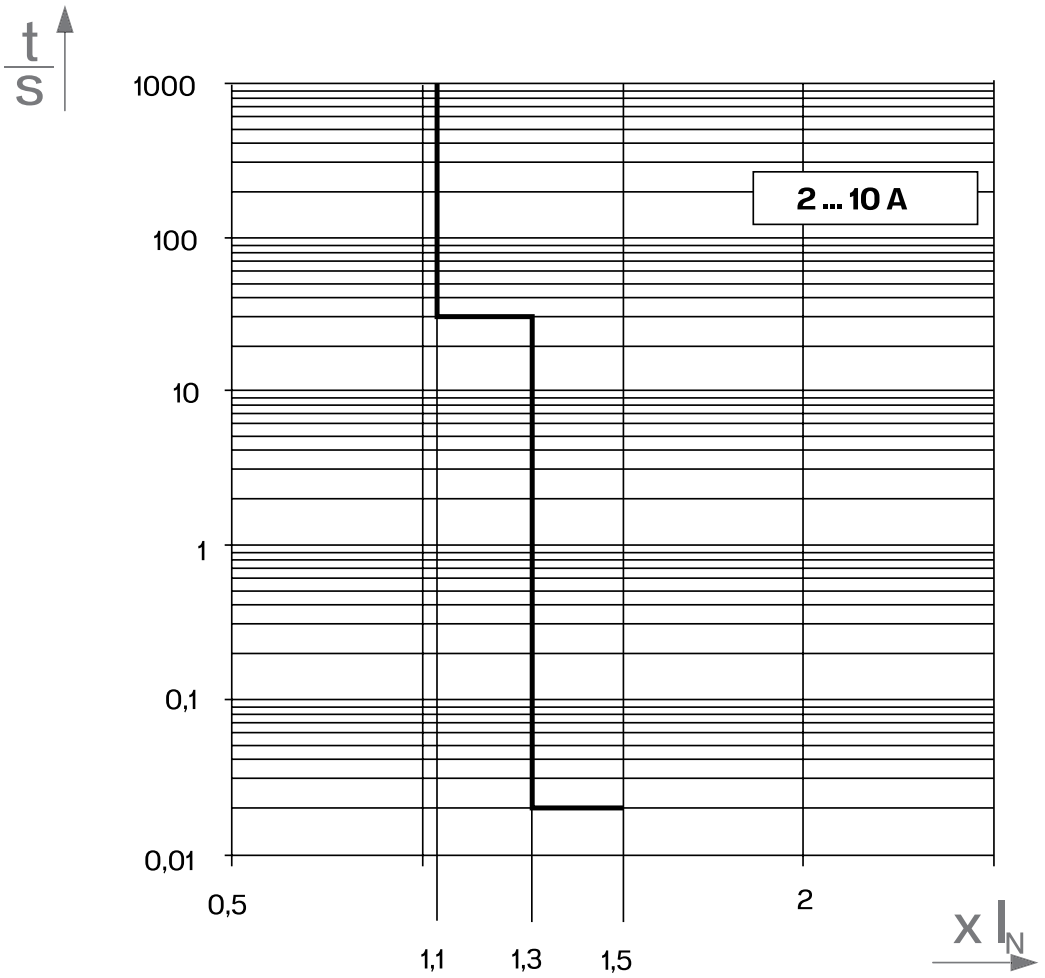
Diagram



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