Electronic circuit protector REX12

Description

The new electronic overcurrent protection REX12 consists of the supply module EM12-T and the single or double channel electronic circuit protector REX12-T which allows modular side-by-side mounting. The modules with a width of only 12.5 mm feature push-in technology including press release buttons and allow time-saving and maintenance-free wiring without tools. The supply module is designed for DC 24 V and 40 A and accommodates max. 10 mm² with wire end ferrule as a plus (+) supply. On the load output side the circuit protector can be wired with 2.5 mm².

The new generation of electronic overcurrent protection REX12 combines flexibility with a compact design. It is exactly tailored to the needs of machine and panel builders. And what is more: no additional accessories are required when connecting the individual components electrically and mechanically. This helps save time and money!

Features

- Combination of supply module and electronic circuit protector
- Single and double channel selective load protection by means of electronic trip curve
- No accessories required for connecting the components
- Width per channel only 12.5 mm (1-channel) or 6.25 mm (2-channel)
- Fixed current ratings from 1 A to 10 A
- Integral fail-safe element, adjusted to current rating
- Inrush capacity up to 20,000 µF
- Manual ON/OFF/reset momentary switch
- Clear status indication by means of LED and signal contact Si
- Connection via push-in terminals including orange press release buttons

Benefits

- Saves cost – no further accessories required
- Saves time through innovative and flexible mounting and connection technology
- Saves space – with a width of only 12.5 mm for two channels
- Provides flexibility through ease of mounting, disassembly and modular design

Approvals and standards

Approval authority	Standard	Rated voltage	Current rating range
UL	UL 2367	DC 24 V	1 A…10 A
UL	UL 1310	DC 24 V	1 A, 2 A
UL	cULus508listed	DC 24 V	1 A…10 A

Overview of ordering number codes

Supply module	EM12-T00-000-DC24V-40A EM12-T01-001-DC24V-40A
circuit protectors: 1-channel	REX12-TA1-107-DC24V-1A REX12-TA1-107-DC24V-2A REX12-TA1-107-DC24V-3A REX12-TA1-107-DC24V-4A REX12-TA1-107-DC24V-6A REX12-TA1-107-DC24V-8A REX12-TA1-107-DC24V-10A
circuit protectors: 2-channel	REX12-TA2-107-DC24V-1A/1A REX12-TA2-107-DC24V-2A/2A REX12-TA2-107-DC24V-3A/3A REX12-TA2-107-DC24V-4A/4A REX12-TA2-107-DC24V-6A/6A

Technical data (T_{amb} = +23 °C, U_B = DC 24 V)

REX12-TAx-xxx circuit protectors		
REX12-TA1-107-DC24V-xA		1-channel
REX12-TA2-107-DC24V-xA/xA		2-channel
Operating voltage U_B	DC 24 V (18...30 V)	
Closed-circuit current I_0		
REX12-TA1 1-channel	in ON condition	typically 5 mA
REX12-TA2 2-channel	in ON condition	typically 8 mA
Reverse polarity protection	yes	
Power failure buffering time	up to 10 ms	
Current ratings I_N	fixed ratings:	
REX12-TA1	1 A, 2 A, 3 A, 4 A, 6 A, 8 A, 10 A	
REX12-TA2	1 A/1 A, 2 A/2 A, 3 A/3 A, 4 A/4 A, 6 A/6 A	
Visual status indication by LED	green: load circuit connected green/orange blinking: load current warning limit reached 80 % orange: overload or short circuit until disconnection red: - after disconnection due to overload or short circuit - after undervoltage release of operating voltage in ON condition with autoreset OFF: Device switched off by means of ON/OFF momentary switch or no operating voltage	
Load circuit		
Load output	power MOSFET switching output (plus switching)	
Load current warning limit (I_{WLimit})	typically 0.8 x I_N	
hysteresis	typically 5 %	
Overload current disconnection (I_{OL}) with trip times (t_{OL})	typically I_{OL}: I_N x 1.05 typically I_{OL}: I_N x 1.35 typically I_{OL}: I_N x 2.00 typically I_{OL}: I_N x 2.50	t_{OL}: 3s t_{OL}: 0,5 s t_{OL}: 0.1 s t_{OL}: 0.012 s
Short circuit trip time (t_{SC})	typically at short circuti (I_{SC}) (see time/current characteristic) [1] depends on the power suplly	t_{SC}: 0,002 s[1]
Influence of ambient temperature on overload disconnection and load current warning limit	see temperature factor table	

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Technical data (T_{amb} = +23 °C, U_B = DC 24 V)

Fail-safe element integral blade fuse adjusted to related current rating I_N	I_N: 1 A	fail-safe I_N: 1 A
	I_N: 2 A	fail-safe I_N: 2 A
	I_N: 3 A	fail-safe I_N: 3.15 A
	I_N: 4 A	fail-safe I_N: 4 A
	I_N: 6 A	fail-safe I_N: 6.3 A
	I_N: 8 A	fail-safe I_N: 8 A
	I_N: 10 A	fail-safe I_N: 10 A
	I_N: 1 A/1 A	fail-safe I_N: 1 A/1 A
	I_N: 2 A/2 A	fail-safe I_N: 2 A/2 A
	I_N: 3 A/3 A	fail-safe I_N: 3,15 A/3,15 A
	I_N: 4 A/4 A	fail-safe I_N: 4 A/4 A
	I_N: 6 A/6 A	fail-safe I_N: 6.3 A/6.3 A

Voltage drop in load circuit at I_N and at I_N 70 % between LINE+ and LOAD+

I_N: 1 A	typically 180 mV	I_N: 70 %	typically 125 mV
I_N: 2 A	typically 110 mV	I_N: 70 %	typically 80 mV
I_N: 3 A	typically 120 mV	I_N: 70 %	typically 85 mV
I_N: 4 A	typically 115 mV	I_N: 70 %	typically 80 mV
I_N: 6 A	typically 170 mV	I_N: 70 %	typically 110 mV
I_N: 8 A	typically 160 mV	I_N: 70 %	typically 105 mV
I_N: 10 A	typically 180 mV	I_N: 70 %	typically 120 mV

Operating voltage monitoring with regard to low voltage	OFF at typically U_B < 16.0 V ON at typically U_B > 17.5 V with automatic ON and OFF switching	
Switch-on delay - with power ON	channel 1: channel 2:	typically 100 ms typically 200 ms
- when switching on via ON/OFF momentary switch or - after undervoltage	channel 1: channel 2:	typically 5 ms typically 100 ms
	channel 1: channel 2:	typically 5 ms typically 5 ms
Disconnection of load circuit	- manually on the device with the ON/OFF momentary switch - after an overload / short circuit disconnection with storage (no automatic reset) - temporarily at undervoltage - at no operating voltage	
Switch-on of load circuit - momentary switch ON/OFF	device can only be switched on when operating voltage is applied	
- applying operating voltage	the device starts up with the condition last stored	
Reset function	a blocked load output (blocked by overload / short circuit) can externally be reset by the ON/OFF momentary switch	
Leakage current in load circuit in OFF condition	typically < 1 mA	
Inrush capacity	up to 20,000 µF	
Free-wheeling diode	external free-wheeling circuit at inductive load (rating according to load)	
Parallel connection of several load outputs	not allowed	
Status output		
Status indication REX12-T	minus switching signal output group signalling is implemented in connection with EM12-T supply module	
Terminal design	**LOAD+**	
Push-in terminal PT 2.5	0.14 mm²...2.5 mm², flexible AWG26 – AWG14 str	
Stripping length	8 mm...10 mm	
Dimensions (w x h x d)	12.5 x 98,5 x 80 mm	
Mass REX12-TA1-xxx 1-channel REX12-TA2-xxx 2-channel	 approx. 57 g approx. 58 g	

Technical data (T_{amb} = +23 °C, U_B = DC 24 V)

General data		
Housing material	moulded	
Mounting	symmetrical rail to EN 60715-35x7.5	
Ambient temperature	-25 °C...+60 °C (without condensation, cf. EN 60204-1)	
Storage temperature	-40 °C...+70 °C	
Mounting temperature	+5 °C...+60 °C	
Humidity	96 hrs / 95 % RH 40 °C to IEC 60068-2-78-Cab, climate class 3K3 to EN 60721	
Vibration	3 g test to IEC 60068-2-6, test Fc	
Degree of protection	(IEC 60529, DIN VDE 0470) IP30	
EMC requirements (EMC directive, CE logo)	noise emission susceptibility:	EN 61000-6-3 EN 61000-6-2
Insulation co-ordination (IEC 60934)	0.5 kV / pollution degree 2	
Dielectric strength	max. DC 30 V (load circuit)	
Insulation resistance (OFF condition)	n/a, only electronic disconnection	
Approvals	CE logo, UL 2367, File # E306740, cULus508listed, File E492388	

Preferred types

Preferred types	**Standard current ratings (A)**						
REX12-TA1	**2**	**4**	**6**	**10**	**2/2**	**4/4**	**6/6**
REX12-TA1-107-DC24V-	x	x	x	x			
REX12-TA2	**2**	**4**	**6**	**10**	**2/2**	**4/4**	**6/6**
REX12-TA2-107-DC24V-					x	x	x

Ordering number code - REX12-T

Type
REX12 Electronic circuit protector with PT connection technology

Mounting method
T rail mounting

Design
A 1 load output terminal per channel, fixed current ratings xA or xA/xA

Number of channels
1 1 channel
2 2 channels

Version
1 without physical isolation

Signal input
0 without signal input

Signal output:
7 status output

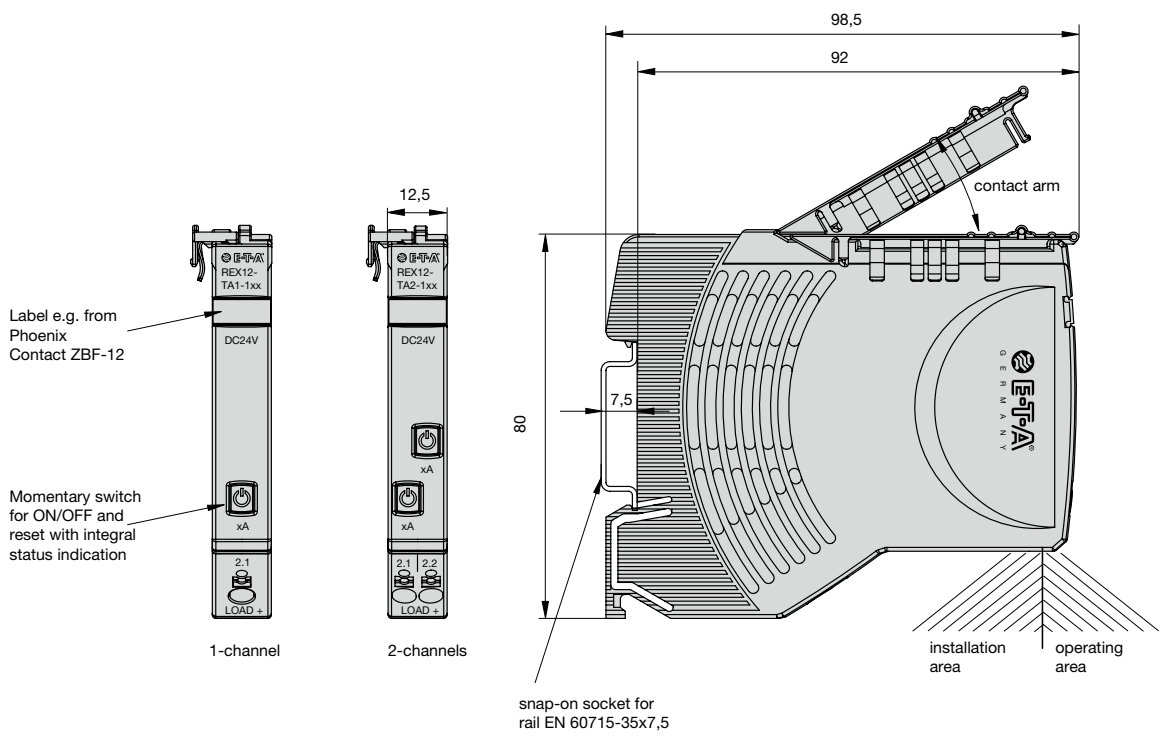
Operating voltage
DC 24 V voltage rating DC 24 V

Current ratings

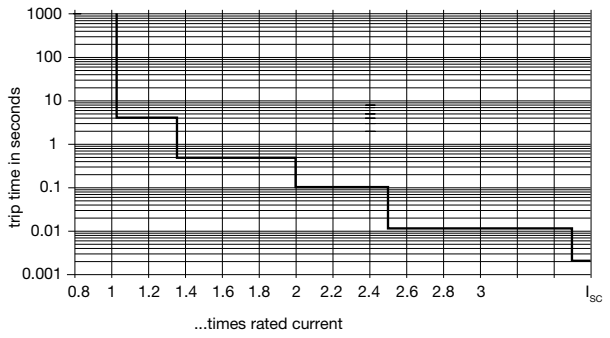
1 A	(only 1-channel)
2 A	(only 1-channel)
3 A	(only 1-channel)
4 A	(only 1-channel)
6 A	(only 1-channel)
8 A	(only 1-channel)
10 A	(only 1-channel)
1 A/1 A	(only 2-channel)
2 A/2 A	(only 2-channel)
3 A/3 A	(only 2-channel)
4 A/4 A	(only 2-channel)
6 A/6 A	(only 2-channel)

REX12 - T	A	1 - 1	0	7	-	DC24V	-	10 A	example of 1-channel
REX12 - T	A	2 - 1	0	7	-	DC24V	-	6 A / 6 A	example of 2-channel

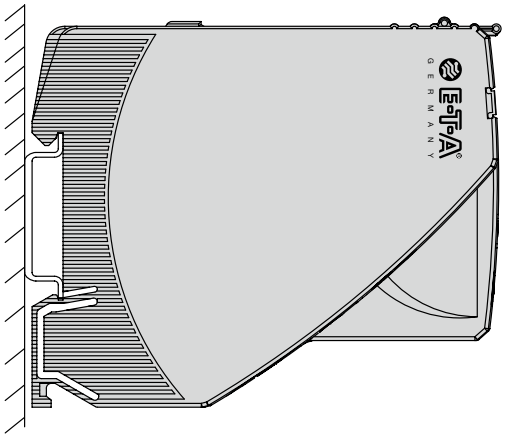
Dimensions with connection diagram: REX12-TA1-xxx and REX12-TA2-xxx circuit protectors



Time/current characteristic (T_{amb} = +23 °C, U_B = DC – 24 V)



Preferred mounting postion REX12: horizontal



Temperature factor / continuous duty

The time/current characteristic depends on the ambient temperature. In order to avoid premature trip, the rating of the circuit protector has to be multiplied with a temperature factor and has to be accounted for when mounted side-by-side (see chapter Technical Information).

Temperature factor table:

ambient temperature [°C]	0	10	23	40	50	60
temperature factor	1	1	1	0,95	0,90	0,85

Note: When mounted side-by-side, the devices can carry max. 80 % of their rated load or a different rating has to be selected (see chapter Technical Information).

Note:
With high temperatures, the load current warning threshold “warn limit typically 0.8 x I_N” will be reduced in accordance with the temperature factor.

Description – EM12-T supply module

The EM12-T supply module receives the DC 24 V supply voltage, e.g. from a switched mode power supply, and distributes it to the mounted circuit protectors via the integral connector arm of the REX12-T.
The potential-free auxiliary contact in the EM12-T indicates any detected failures through the circuit protector, e.g. to the superordinate control unit (CPU).

Technical data (T_{amb} = +23 °C, U_B = DC 24 V)

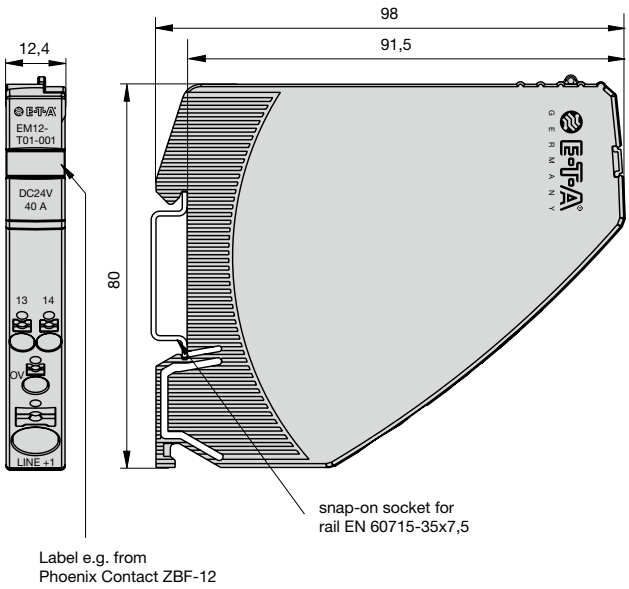
Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. 40 A
Reverse polarity protection	yes
Quiescent current I_0	typically 10 mA
Potential-free auxiliary change-over contact	max. DC 30 V / 0.5 A min. 10 V / 1 mA
Group signalling Si Contact: Si (13) / Si (14)	auxiliary contact, make contact
normal condition:	auxiliary contact closed - when ON, load output connected - when OFF, load output disconnected
fault condition:	auxiliary contact open - after an overload or short circuit disconnection - after undervoltage release of operating voltage in ON condition with autoreset - at no operating voltage U_B in supply module
Insulation co-ordination	0.5 kV / pollution degree 2
Power failure buffering time	up to 10 ms
Terminal design	**LINE+**
Push-in terminal PT 10	0.5 mm²...10 mm², flexible AWG20 – AWG8 str
Stripping length	18 mm...10 mm
Terminal design	**0 V / Si 13 / Si 14**
Push-in terminal PT 2.5	0.14 mm²...2.5 mm², flexible AWG26 – AWG14 str
Stripping length	8 mm...10 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Number of circuit protectors to be mounted side-by-side to EM12 REX12-TA1-x or REX12-TA2-x	max. 16 pcs

Ordering number code – EM12

Type
EM12 supply module for REX, with PT connection technology
Mounting method
T rail mounting
Version: communication, interface
00 without signal
01 analog signal
Additional functionality
0 without
Signal input:
0 without signal input
Signal output:
0 without signal make contact
1 signal make contact
Operating voltage
DC 24 V voltage rating DC 24 V
Current ratings
40 A

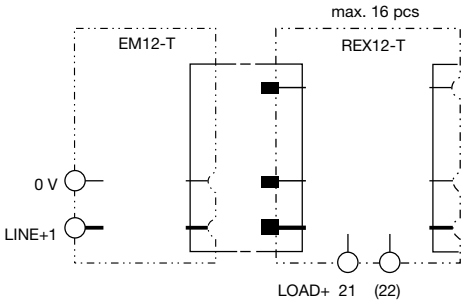
EM12 - T 01 - 0 0 1 - DC 24 V - 40 A ordering example

Dimensions EM12-T01-xxx supply module

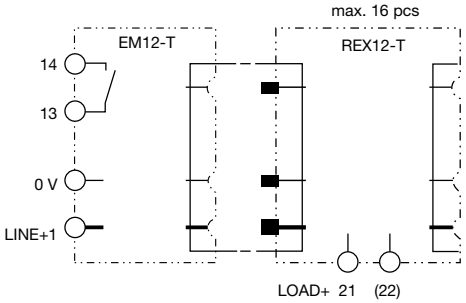


Schematic diagram EM12-Txx-xxx with REX12-xx

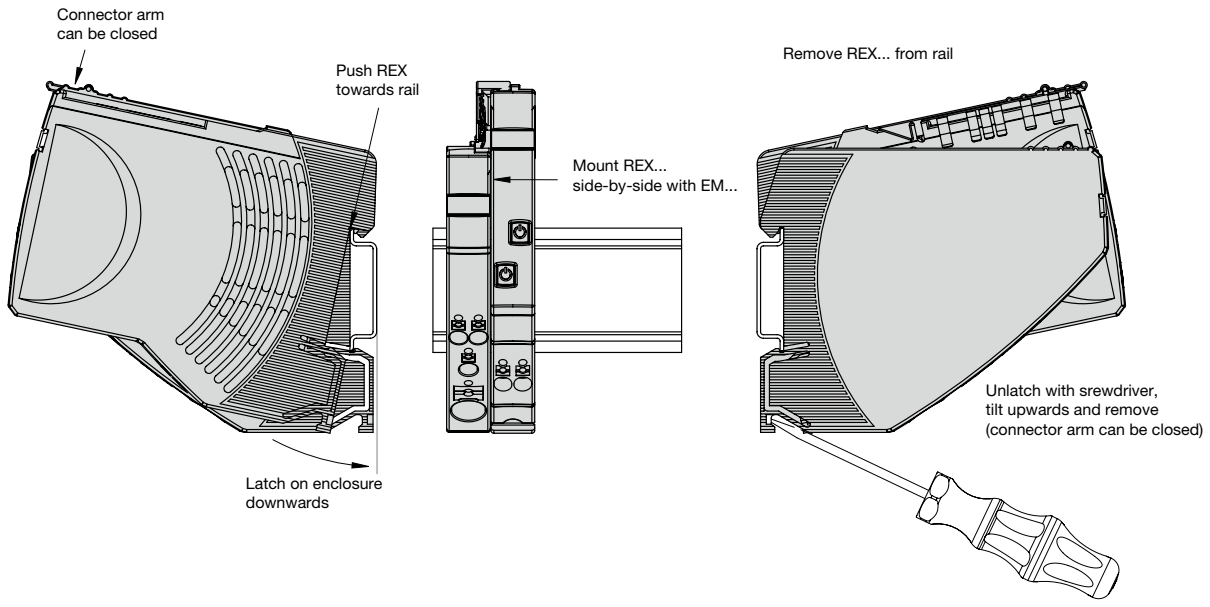
EM12-T00-000-DC24V-40A



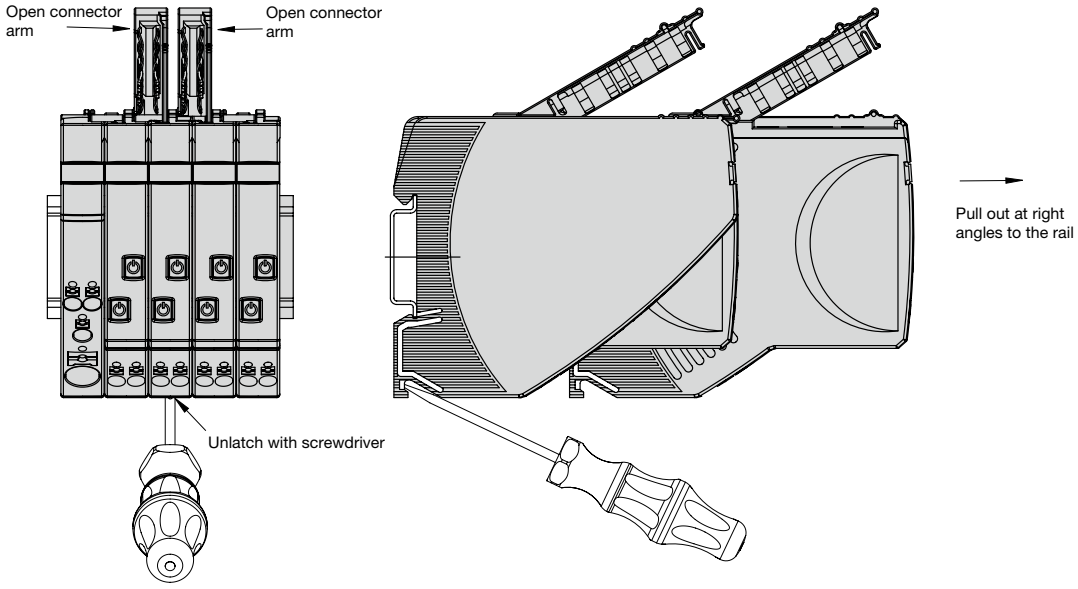
EM12-T01-001-DC24V-40A



Application example: REX... mounting on or removing from symmetrical rail



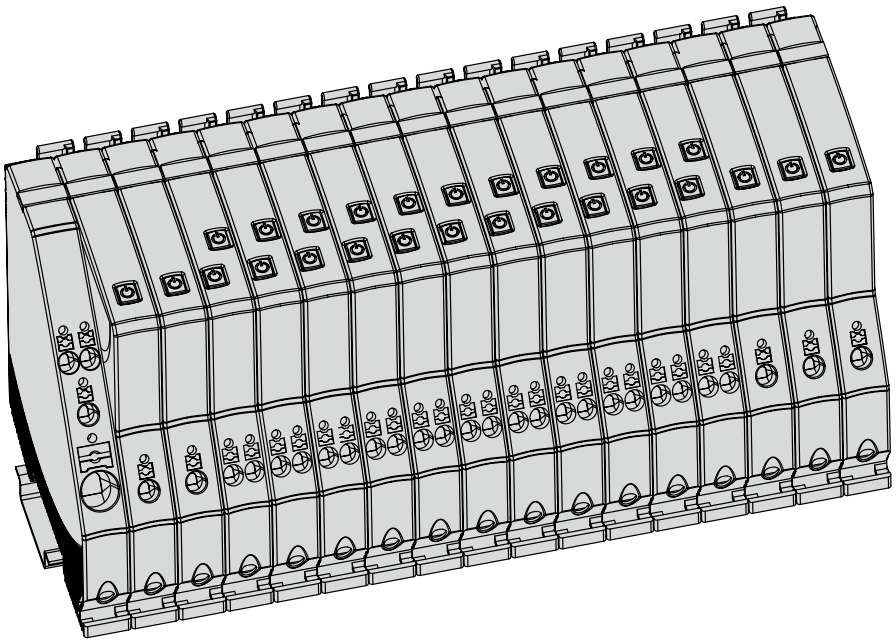
Application example: REX... replacement or disassembly



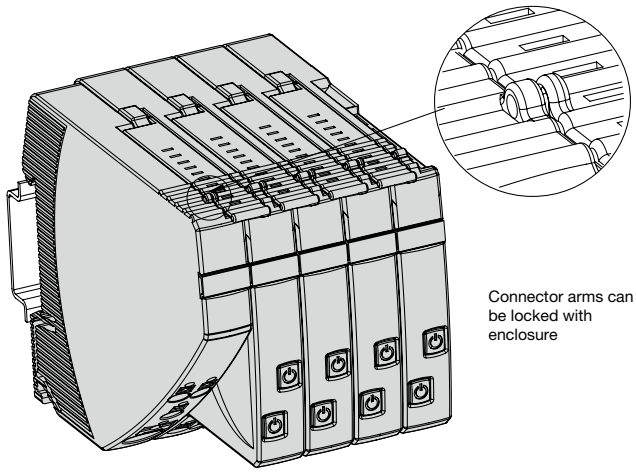
Instructions for installation

Mounting or actuation of the REX connector arm must only be effected at dead-voltage. For start-up the REX connector arm must be closed.

Application example: EM12-T with REX12-TA1… and REX12-TA2…



Application example: REX... Locked connector arms



Connector arms can be locked with enclosure

Application example: REX12(D)-T... distance between cable duct and connector arm