

Description

The compact and flexible all-in-one solution REX consists of several perfectly matched components. It comprises the EM12-T supply module for the plus and minus potential via a single or double channel REX12-T electronic circuit protector which can be mounted side by side in any number and the PM12-T potential extension module for plus and minus multiplication. Connection of the only 12.5 mm wide modules is exclusively with push-in terminals which allow no-tool time-saving wiring.

Depending on the requirement, up to 16 circuit protectors can be placed on the symmetrical rail and are electrically connected by means of built-in connector system - no further accessories required. The circuit protector REX12-T offers selective overcurrent protection by responding to short circuit or overload faster than the switch mode power supply. Capacitive loads of up to 20,000 µF can be switched on without problems. The circuit protectors are available in all standard current ratings from 1 A to 10 A. Besides the UL508listed approval and NEC Class2, the REX12-T also meets the requirements of cable protection to EN60204-1.

Features

- Combination of supply modules, overcurrent protection and power distribution
- 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
- Switching capacitive loads 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 50 % time through innovative and flexible mounting and connection technology
- Saves space – with a width of only 12,5 mm per channel
- Provides flexibility through ease of mounting, disassembly and modular design

Preferred types – a short explanation. For more details on all configurations please see ordering number code on page 3

Preferred types are E-T-A products most frequently used by our customers. We manufacture our preferred types in substantial quantities.

At the same time our preferred types are supplied at shorter lead times than non-standard versions.

Preferred types

preferred types	short description	preferred ratings (A)						
REX12-TA1	1-channel	2	4	6	10	2/2	4/4	6/6
REX12-TA1-107-DC24V-		x	x	x	x			
REX12-TA2	2-channel	2	4	6	10	2/2	4/4	6/6
REX12-TA2-107-DC24V-						x	x	x

Approval logos and markings



Data sheet

The current data sheet is available on our website: www.e-t-a.de/d359

Technical data ($T_{amb} = +23\text{ }^{\circ}\text{C}$, $U_B = \text{DC } 24\text{ V}$)

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 current ratings	1 A, 2 A, 3 A, 4 A, 6 A, 8 A, 10 A
REX12-TA2 current ratings	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 90 % 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 $0.9 \times I_N$
hysteresis	typically 5 %
Overload current disconnection (I_{OL}) with trip times (t_{OL})	typically $I_{OL}: I_N \times 1.05$ $t_{OL}: 3\text{ s}$ typically $I_{OL}: I_N \times 1.35$ $t_{OL}: 0.5\text{ s}$ typically $I_{OL}: I_N \times 2.00$ $t_{OL}: 0.1\text{ s}$ typically $I_{OL}: I_N \times 2.50$ $t_{OL}: 0.012\text{ s}$
short circuit trip time (t_{SC})	typically at short circuit (I_{SC}) $t_{SC}: 0.002\text{ s}^{1)}$ see time/current characteristic ¹⁾ depending on the power source Note: Selection of current rating of the circuit protector $\leq$ rating of power supply
Influence of ambient temperature on overload disconnection and load current warning limit	see temperature factor table
Continuous Current IC	typically $0.8 \times I_N$ (Fail Safe Element is protected by REX12)
Fail-safe element integral blade fuse adjusted to related current rating I_N	$I_N: 1\text{ A}$ fail-safe $I_N: 1\text{ A}$ $I_N: 2\text{ A}$ fail-safe $I_N: 2\text{ A}$ $I_N: 3\text{ A}$ fail-safe $I_N: 3.15\text{ A}$ $I_N: 3\text{ A-CL2}$ fail-safe $I_N: 4\text{ A}$ $I_N: 4\text{ A}$ fail-safe $I_N: 4\text{ A}$ $I_N: 4\text{ A-CL2}$ fail-safe $I_N: 4\text{ A}$ $I_N: 6\text{ A}$ fail-safe $I_N: 6.3\text{ A}$ $I_N: 8\text{ A}$ fail-safe $I_N: 8\text{ A}$ $I_N: 10\text{ A}$ fail-safe $I_N: 10\text{ A}$ $I_N: 1\text{ A/1 A}$ fail-safe $I_N: 1\text{ A/1 A}$ $I_N: 2\text{ A/2 A}$ fail-safe $I_N: 2\text{ A/2 A}$ $I_N: 3\text{ A/3 A}$ fail-safe $I_N: 3.15\text{ A/3.15 A}$ $I_N: 3\text{ A/3 A-CL2}$ fail-safe $I_N: 4\text{ A/4 A}$ $I_N: 4\text{ A/4 A}$ fail-safe $I_N: 4\text{ A/4 A}$ $I_N: 4\text{ A/4 A-CL2}$ fail-safe $I_N: 4\text{ A/4 A}$ $I_N: 6\text{ A/6 A}$ fail-safe $I_N: 6.3\text{ A/6.3 A}$

Technical data ($T_{amb} = +23\text{ }^{\circ}\text{C}$, $U_B = \text{DC } 24\text{ V}$)

Voltage drop in load circuit at I_N and at I_N 70 % between LINE+ and LOAD+			
$I_N: 1\text{ A}$	typically 180 mV	$I_N: 70\text{ \%}$	typically 125 mV
$I_N: 2\text{ A}$	typically 110 mV	$I_N: 70\text{ \%}$	typically 80 mV
$I_N: 3\text{ A}$	typically 120 mV	$I_N: 70\text{ \%}$	typically 85 mV
$I_N: 3\text{ A-CL2}$	typically 130 mV	$I_N: 70\text{ \%}$	typically 90 mV
$I_N: 4\text{ A}$	typically 115 mV	$I_N: 70\text{ \%}$	typically 80 mV
$I_N: 4\text{ A-CL2}$	typically 180 mV	$I_N: 70\text{ \%}$	typically 120 mV
$I_N: 6\text{ A}$	typically 170 mV	$I_N: 70\text{ \%}$	typically 110 mV
$I_N: 8\text{ A}$	typically 160 mV	$I_N: 70\text{ \%}$	typically 105 mV
$I_N: 10\text{ A}$	typically 180 mV	$I_N: 70\text{ \%}$	typically 120 mV

Operating voltage monitoring with regard to low voltage	OFF at typically $U_B < 16.0\text{ V}$ ON at typically $U_B > 19.0\text{ V}$ hysteresis typically 2 V with automatic ON and OFF switching
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Switch-on delay - with power ON	channel 1: typically 100 ms channel 2: typically 200 ms
- when switching on via ON/OFF momentary switch or - after undervoltage	channel 1: typically 5 ms channel 2: typically 100 ms channel 1: typically 5 ms channel 2: 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
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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
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Leakage current in load circuit in OFF condition	typically $< 1\text{ mA}$
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Capacitive loads	up to 20,000 μF : depending on: cable attenuation, power supply used, load current and current rating
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Free-wheeling diode	external free-wheeling circuit at inductive load (rating according to load)
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Parallel connection of several load outputs	not allowed
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Status output

Status indication REX12-T minus switching signal output	Group signalling is implemented in connection with EM12-T supply module
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Terminals	LOAD+
Push-in terminal PT 2.5	0.14 mm ² ... 2.5 mm ² , flexible AWG24 – AWG14 rigid
Stripping length	8 mm ... 10 mm
Dimensions (w x h d)	12.5 x 98.5 x 80 mm

Mass	
REX12-TA1-xxx 1-channel approx.	57 g
REX12-TA2-xxx 2-channel approx.	58 g

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

General data	REX / EM / PM
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° ... +60 °C
Humidity	96 hrs / 95% RH/40 °C to IEC 60068-2-78-Cab climate class 3K3 to EN 60721
Corrosion only PM and EM accessories	96hrs. in 5 % salt mist to IEC 60068-2-11 test Ka
Vibration	3g test to IEC 60068-2-6, test Fc
Degree of protection operating area REX12:	(IEC 60529, DIN VDE 0470) IP30
terminal area EM, PM:	IP20
EMC requirements (EMC directive, CE logo)	noise emission EN 61000-6-3 susceptibility: 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
Conformity	CE marking

Approvals and standards

Approval authority	Standard	UL file no.	Voltage rating	Current rating range
UL	UL 2367	E306740	DC 24 V	1 A...10 A
UL	UL 1310 NEC Class2	E306740	DC 24 V	1 A, 2 A, 3 A, 4 A
UL	cULus 508 listed	E492388	DC 24 V	1 A...10 A

PM and EM – accessories approvals see technical data of accessories

Preferred types

Preferred types are E-T-A products most frequently used by our customers. We manufacture our preferred types in substantial quantities. At the same time our preferred types are supplied at shorter lead times than non-standard versions.

preferred types	short description	preferred ratings (A)						
REX12-TA1	1-channel	2	4	6	10	2/2	4/4	6/6
REX12-TA1-107-DC24V-		x	x	x	x			
REX12-TA2	2-channel	2	4	6	10	2/2	4/4	6/6
REX12-TA2-107-DC24V-						x	x	x

Customer-specific variants

Looking for a version you cannot find in our ordering number code? Please get in touch. We will find a solution for you.

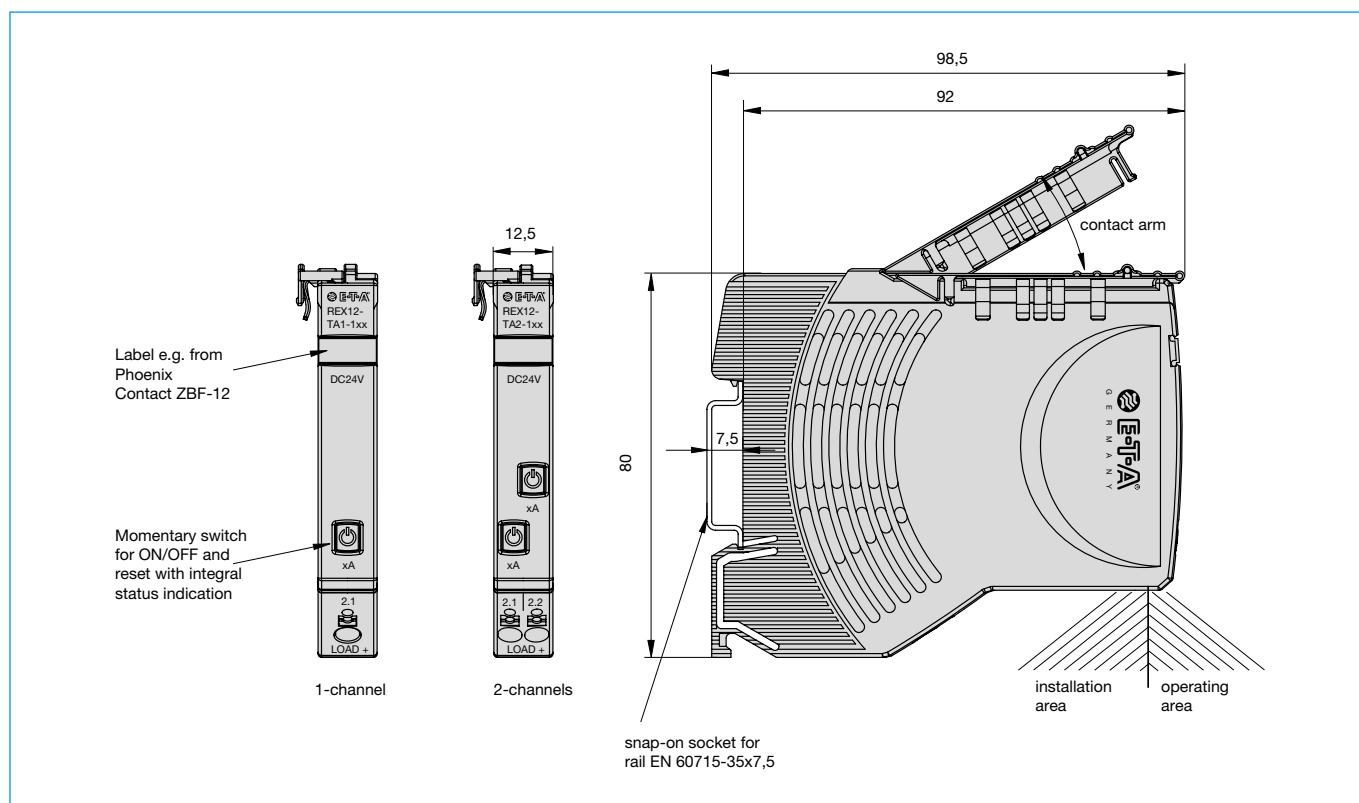
Ordering number code – REX12-T

Type	Electronic circuit protector with PT connection technology						
Mounting method	rail mounting						
Design	1 load output terminal per channel, fixed current ratings xA or xA/xA						
Number of channels	1 1 channel (only 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 rating range	1 A (only 1 channel, Class2) 2 A (only 1 channel, Class2) 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 channels, Class2) 2 A / 2 A (only 2 channels, Class2) 3 A/3 A (only 2 channels) 4 A/4 A (only 2 channels) 6 A/6 A (only 2 channels)						
Approval	CL2 Class2 (only for 3A and 4A versions)						
REX12 - T	A	1 - 1	0	7 -	DC24V -	10 A	example of 1-chan.
REX12 - T	A	2 - 1	0	7 -	DC24V -	4A / 4A CL2	example of 2-chan.

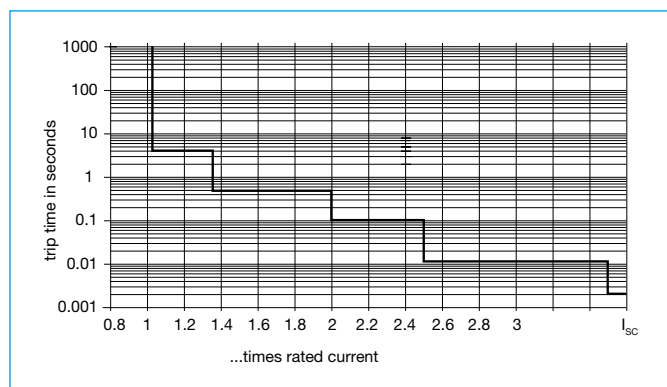
Overview of ordering number codes

Supply module	EM12-T00-000-DC24V-40A EM12-T01-001-DC24V-40A
Circuit protectors: 1-channel	REX12-TA1-107-DC24V-1A (Class2) REX12-TA1-107-DC24V-2A (Class2) REX12-TA1-107-DC24V-3A REX12-TA1-107-DC24V-3A-CL2 (Class2) REX12-TA1-107-DC24V-4A REX12-TA1-107-DC24V-4A-CL2 (Class2) 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 (Class2) REX12-TA2-107-DC24V-2A/2A (Class2) REX12-TA2-107-DC24V-3A/3A REX12-TA2-107-DC24V-3A/3A-CL2 (Class2) REX12-TA2-107-DC24V-4A/4A REX12-TA2-107-DC24V-4A/4A-CL2 (Class2) REX12-TA2-107-DC24V-6A/6A
Accessories	
Supply modules	EM12-T00-100-LINE-40A EM12-T00-200-LINE-40A EM12-T00-000-GND-40A EM12-T00-300-GND-40A
Potential modules	PM12-T01-00-LOAD-20A PM12-T02-00-LOAD-20A PM12-T03-00-GND-20A

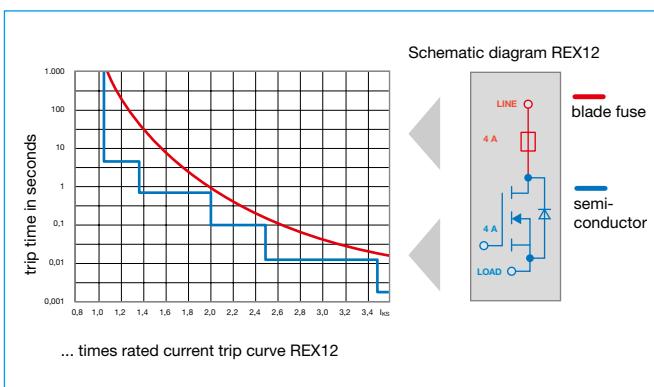
Dimensions with connection diagram: REX12-TA1-xxx and REX12-TA2-xxx circuit protectors



Time/current characteristic ($T_{amb} = +23\text{ }^{\circ}\text{C}$, $U_B = \text{DC} - 24\text{ V}$)



Basic trip curve and schematic diagram REX12



Temperature factor / continuous duty

The time/current characteristic depends on the ambient temperature. In order to determine the max. load current, please multiply the current rating with the temperature factor and consider the factor for side-by-side mounting.

Temperature factor table:

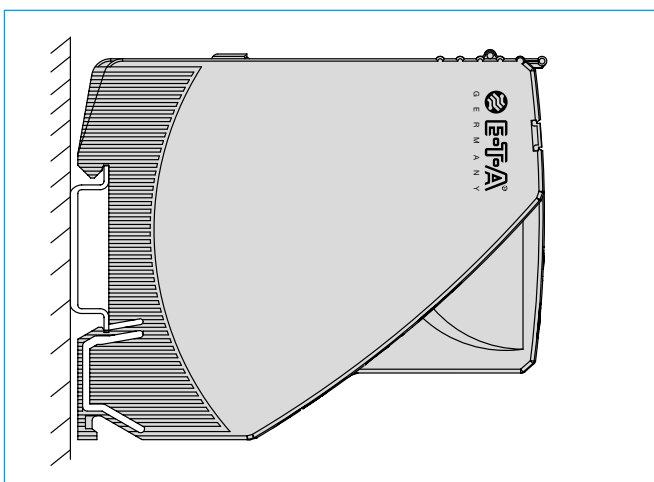
ambient temperature [$^{\circ}\text{C}$]	0	10	23	40	50	60
temperature factor	1	1	1	0.95	0.90	0.85

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 technical information: www.e-t-a.de/ti_e).

Note:

With high temperatures, the load current warning threshold "warn limit typically $0.9 \times I_N$ " will be reduced in accordance with the temperature factor.

Preferred mounting position REX12: horizontal



Description – EM12-T supply module

The EM12-T supply module receives the DC 24 V supply voltage, e.g. from a switch 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).

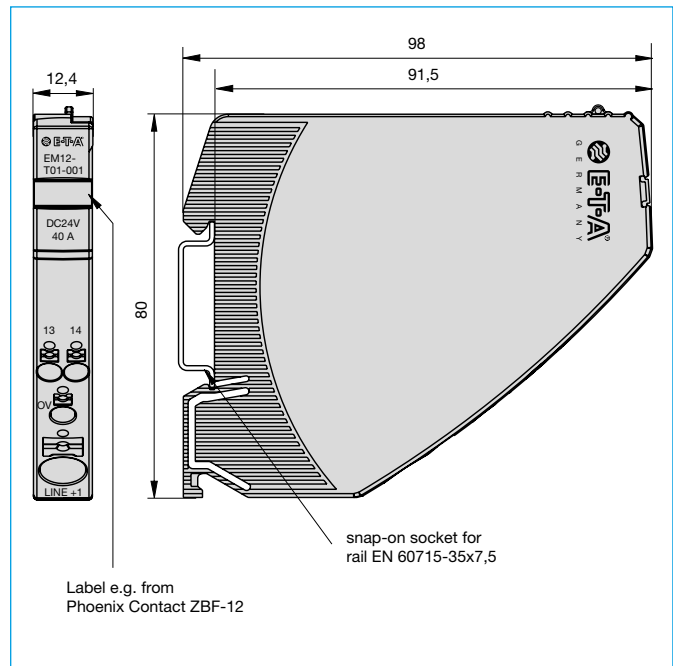
Technical data ($T_{amb} = +23^{\circ}\text{C}$, $U_B = \text{DC } 24\text{ V}$)

Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. 40 A
Reverse polarity protection	yes
Signalling	only EM12-T01-001-DC24V-40A
Quiescent current I_0	typically 10 mA
potential-free auxiliary 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 based on all protection modules - when ON, load output connected - when OFF, load output disconnected
Fault condition:	auxiliary contact open based on one or more protection modules - after overload or short circuit trip - 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 Si	up to 10 ms
Terminals	LINE+
Push-in terminal PT 10	0.5 mm ² ... 10 mm ² , flexible AWG20 – AWG8 rigid
stripping length	18 mm
Terminals	0 V / Si 13 / Si 14
Push-in terminal PT 2.5	0.14 mm ² ... 2.5 mm ² , flexible AWG24 – AWG14 rigid
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 on EM12 side by side	
REX12-TA1-x	
REX12-TA2-x	max. 16 pcs

Ordering number code – EM12

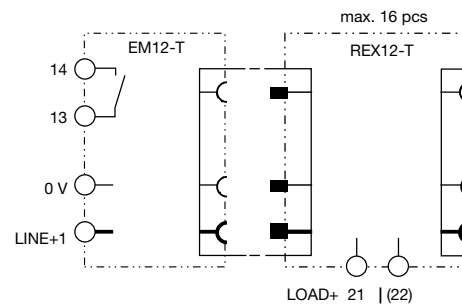
type	
EM12	supply module for REX12, with PT connection technology
Mounting method	
T	rail mounting
Version: Communication, interface	
00	without signal
01	analog signal
Additional functionality	
0	without
Signal input	
0	without signal input
Signal output	
0	without auxiliary contact
1	signal make contact
Operating voltage	
DC 24 V	voltage rating DC 24 V
Current rating range	
40 A	40 A
EM12 - T 01 - 0 0 1 - DC 24 V - 40 A	example

Dimensions EM12-T01-xxx supply module

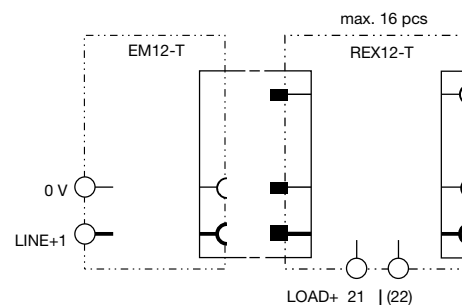


Schematic diagram EM12-Txx-xxx with REX12-xx

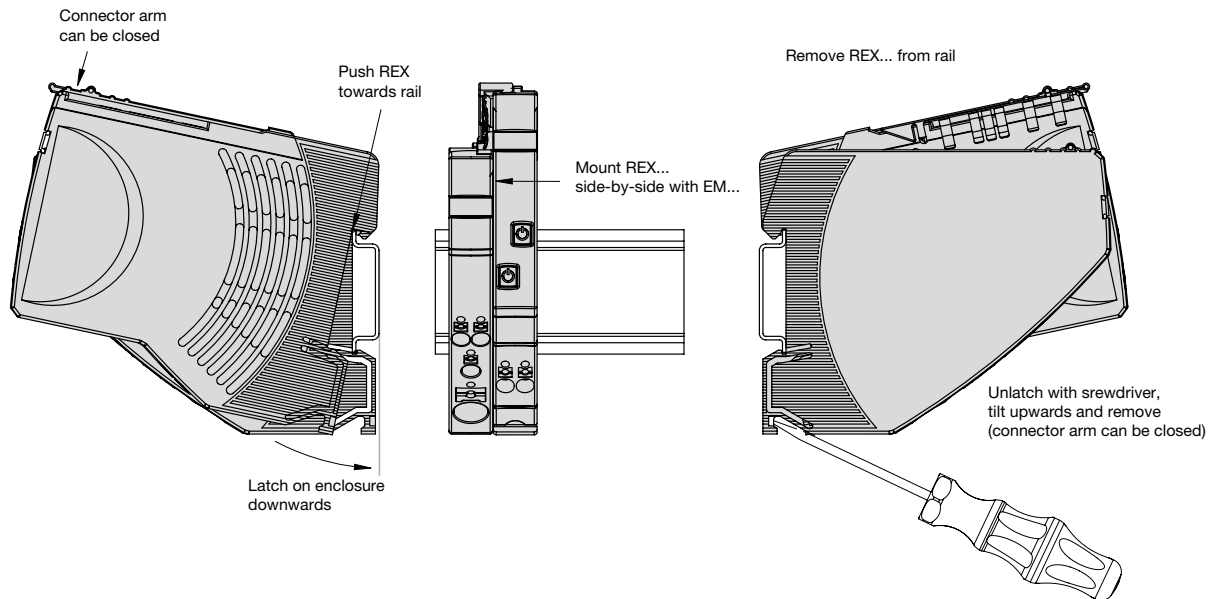
EM12-T01-001-DC24V-40A



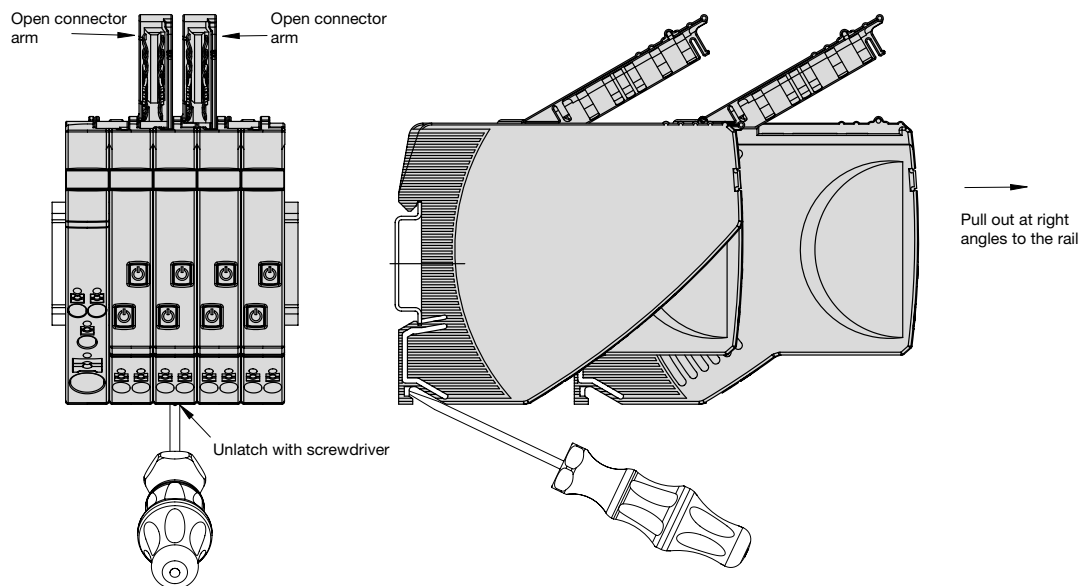
EM12-T00-000-DC24V-40A



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



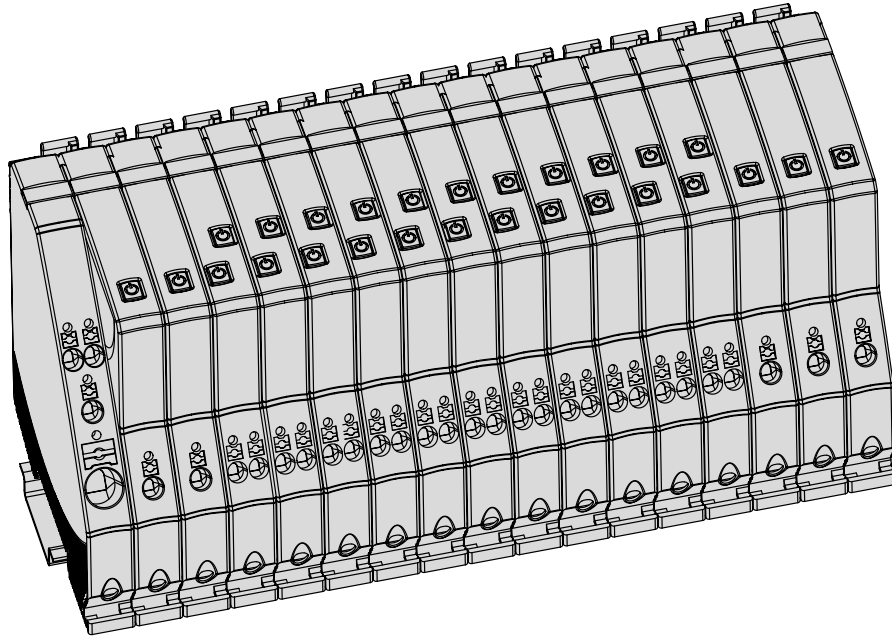
Application example: REX... replacement or disassembly



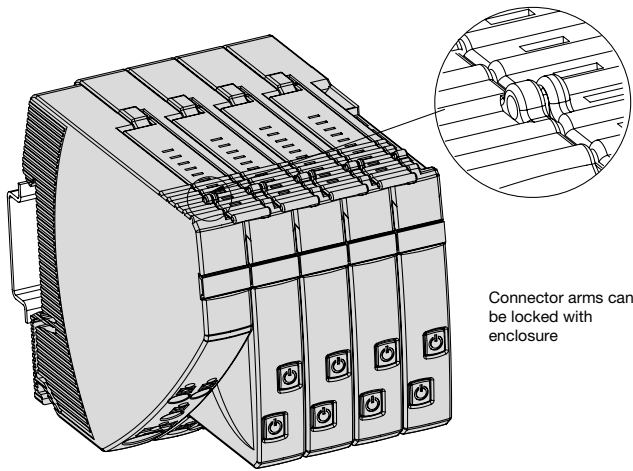
Instructions for installation

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.

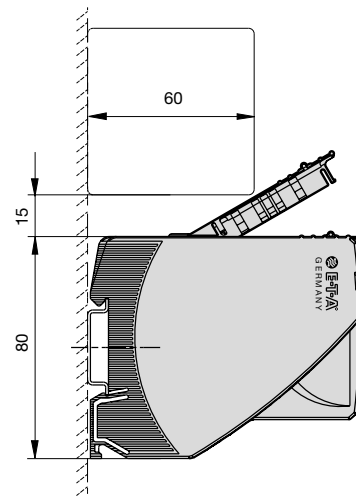
Application example: EM12-T with REX12-TA1... and REX12-TA2...



Application example: REX Locked connector arms



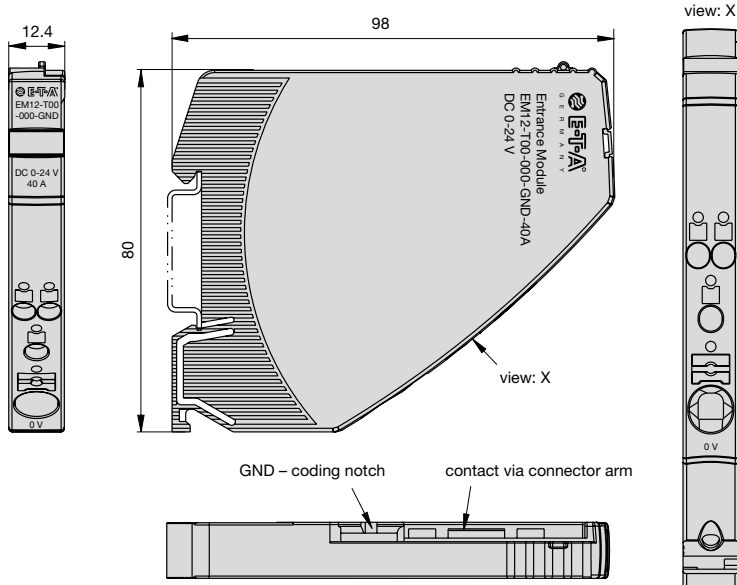
Application example: REX12(D)-T... distance between cable duct and connector arm



All information and data given on our products are accurate and reliable to the best of our knowledge, but E-T-A does not accept any responsibility for the use in applications which are not in accordance with the present specification. E-T-A reserves the right to change specifications at any time in the interest of improved design, performance and cost effectiveness. Dimensions are subject to change without notice. Please enquire for the latest dimensional drawing with tolerances if required. All dimensions, data, pictures and descriptions are for information only and are not binding. Amendments, errors and omissions excepted. Ordering codes of the products may differ from their marking.

Accessories

EM12-T00-000-GND-40A supply module left – 0V – GND

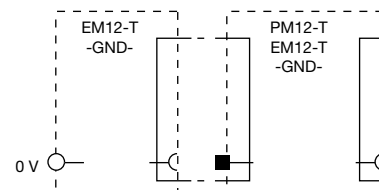


Technical data

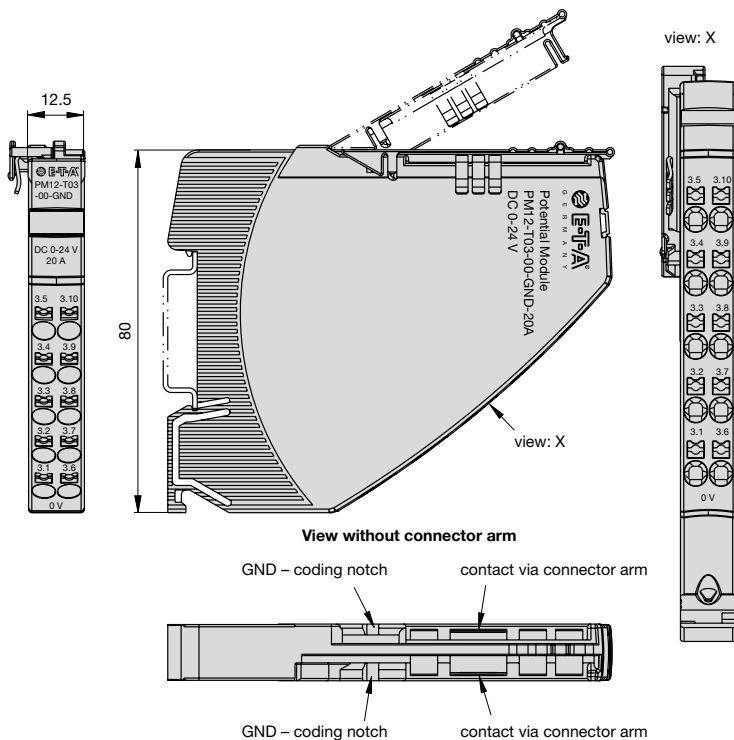
Please observe general data of REX / EM / PM	
Operating voltage U_B	0 V – DC 24 V (0 ... 30 V)
Operating current I_B	max. load 40 A
line terminal	0 V – GND
Push-in terminal PT 10	0.5 mm ² ... 10 mm ² , flexible AWG24 – AWG8 rigid
stripping length	18 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 40 g
Approvals	UL 1059, File # E335289

Schematic diagram

EM12-T00-000-GND-40A



PM12-T03-00-GND-20A potential module – GND (10-way)

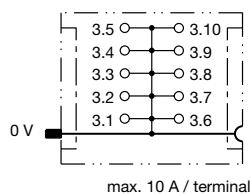


Technical data

Please observe general data of REX / EM / PM	
Operating voltage U_B	0 V – DC 24 V (0 ... 30 V)
Operating current I_B	max. load 20 A
line terminal	0 V – GND
Push-in terminal PT 2.5	0.14 mm ² ... 2.5 mm ² , flexible AWG24 – AWG14 rigid
stripping length	8 mm ... 10 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Approvals	UL 1059, File # E335289

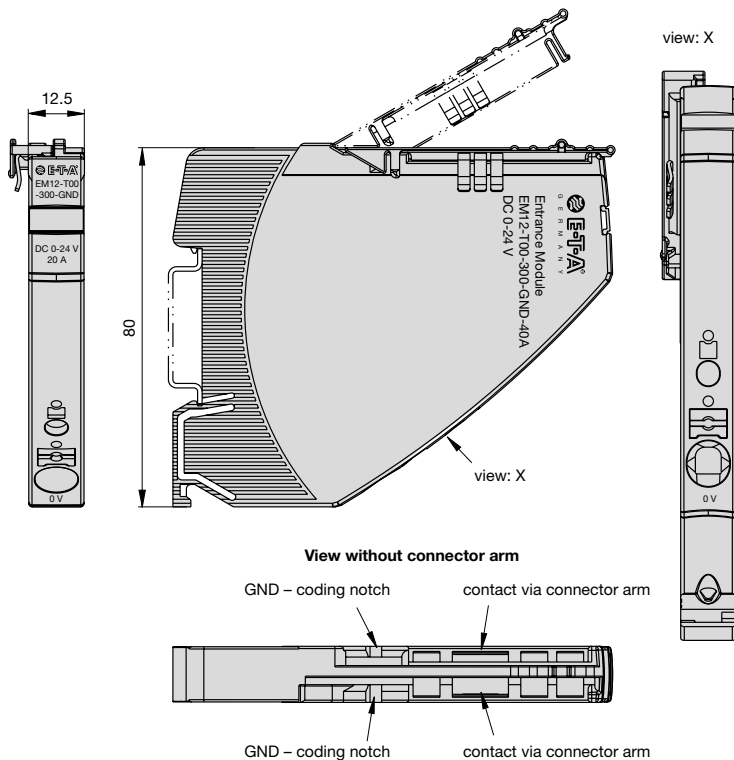
Schematic diagram

PM12-T03-00-GND-20A



Accessories

EM12-T00-300-GND-40A supply module centre/right – 0V – GND

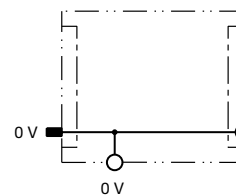


Technical data

Please observe general data of REX / EM / PM	
Operating voltage U_B	0 V – DC 24 V (0 ... 30 V)
Operating current I_B	max. load 40 A
line terminal	0 V – GND
Push-in terminal PT 10	0.5 mm ² ... 10 mm ² , flexible AWG24 – AWG8 rigid
stripping length	18 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 45 g
Approvals	UL 1059, File # E335289

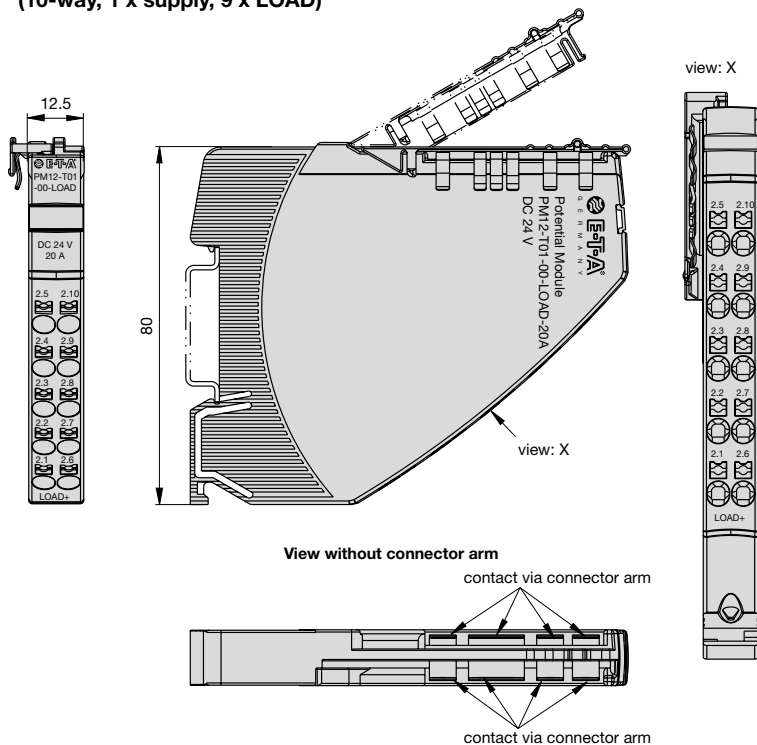
Schematic diagram

EM12-T00-300-GND-40A



Accessories

PM12-T01-00-LOAD-20A potential module – LOAD (10-way, 1 x supply, 9 x LOAD)

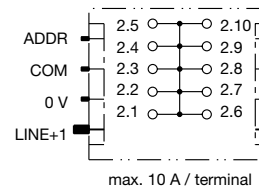


Technical data

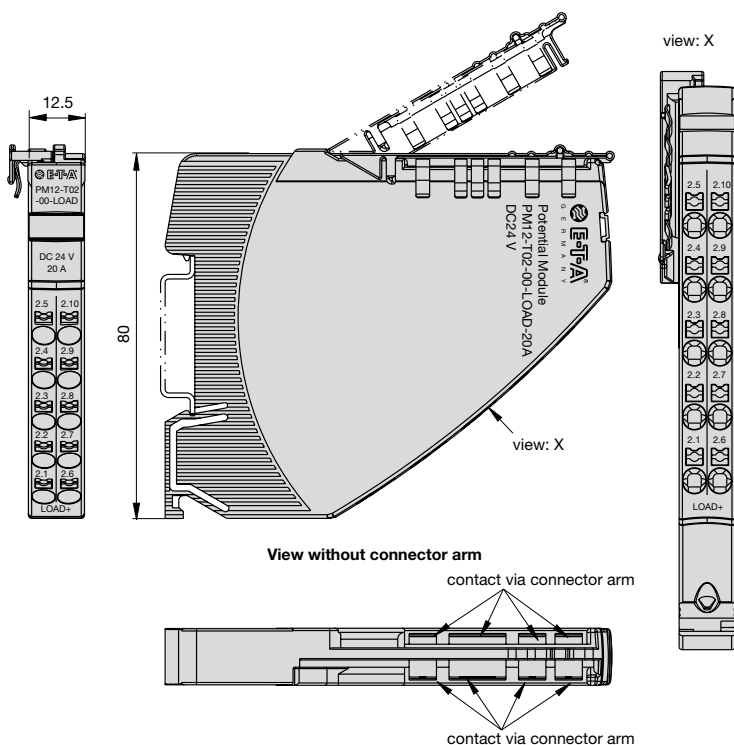
Please observe general data of REX / EM / PM	
Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. load 20 A
Insulation co-ordination	0.8 kV / pollution degree 2
Terminals	LOAD+
Push-in terminal PT 2.5	0.14 mm ² ... 2.5 mm ² , flexible
stripping length	AWG24 – AWG14 rigid 8 mm ... 10 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Approvals	UL 1059, File # E335289

Schematic diagram

PM12-T01-00-LOAD-20A



PM12-T02-00-LOAD-20A potential module – LOAD (2 x 5-way, 1 x supply and 4 x LOAD each)

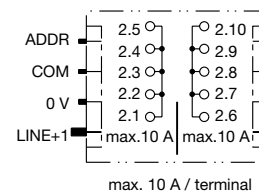


Technical data

Please observe general data of REX / EM / PM	
Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. load 20 A
Insulation co-ordination	0.8 kV / pollution degree 2
Terminals	LOAD+
Push-in terminal PT 2.5	0.14 mm ² ... 2.5 mm ² , flexible
stripping length	AWG24 – AWG14 rigid 8 mm ... 10 mm
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Approvals	UL 1059, File # E335289

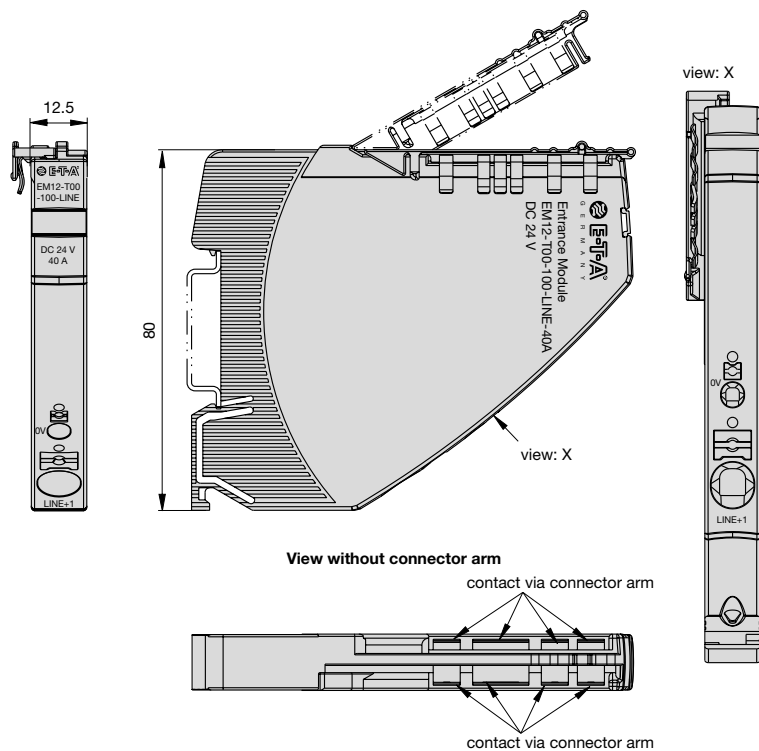
Schematic diagram

PM12-T02-00-LOAD-20A



Accessories

EM12-T00-100-LINE-40A supply module centre/right – LINE, LINE connected

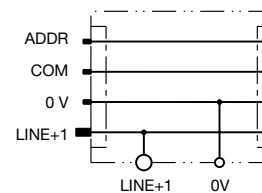


Technical data

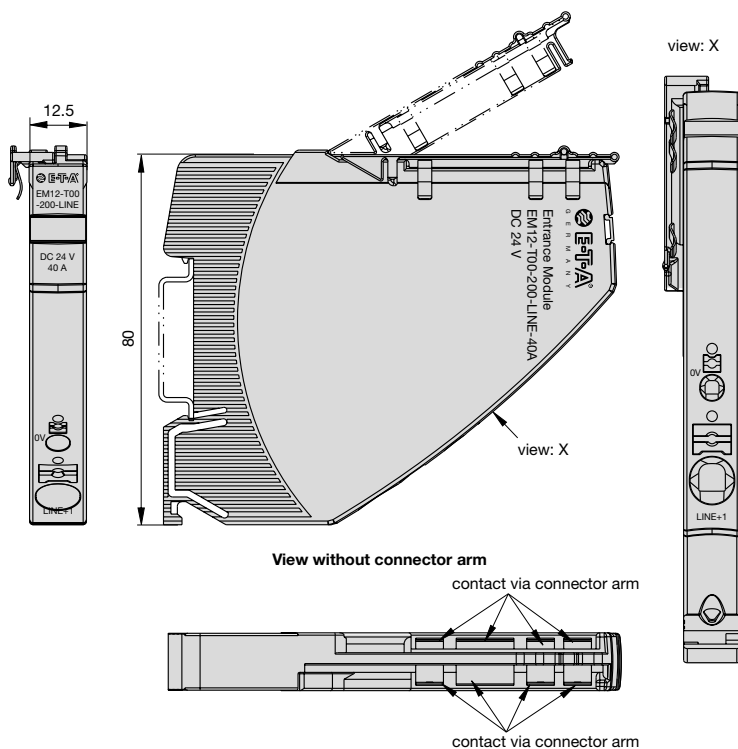
Please observe general data of REX / EM / PM	
Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. load 40 A
Insulation co-ordination	0.8 kV / pollution degree 2
Terminals	LINE+1
Push-in terminal PT 10	0.5 mm ² ... 10 mm ² , flexible AWG24 – AWG8 rigid 18 mm
stripping length	
Terminals	0 V
push-in terminal PT 2.5	0.14mm ² ... 2.5mm ² , flexible AWG26 – AWG14 rigid 8 mm ... 10 mm
Stripping length	
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Approvals	UL 1059, File # E335289

Schematic diagram

EM12-T00-100-LINE-40A



EM12-T00-200-LINE-40A supply module centre/LINE, LINE separated

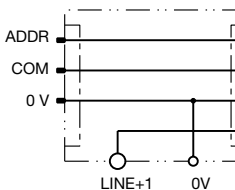


Technical data

Please observe general data of REX / EM / PM	
Operating voltage U_B	DC 24 V (18...30 V)
Operating current I_B	max. load 40 A
Insulation co-ordination	0.8 kV / pollution degree 2
Terminals	LINE+1
Push-in terminal PT 10	0.5 mm ² ... 10 mm ² , flexible AWG24 – AWG8 rigid 18 mm
stripping length	
Terminals	0 V
Push-in terminal PT 2.5	0.14mm ² ... 2.5mm ² , flexible AWG24 – AWG14 rigid 8 mm ... 10 mm
stripping length	
Dimensions (w x h x d)	12.5 x 98 x 80 mm
Mass	approx. 52 g
Approvals	UL 2367, File # E306740; cULus508listed, File # E492388; pending

Schematic diagram

EM12-T00-200-LINE-40A



Application example: EM12-T ... with REX12-TAx... and PM12-...

