Description

E-T-A's ESX10-T electronic circuit protector is only 12.5 mm wide and selectively protects all DC 24 V load circuits, thereby increasing the uptime of machines and systems. This is achieved by a combination of active electronic current limitation in the event of a short circuit and overload disconnection typically from 1.1 times rated current. The ESX10-T responds faster than frequently used DC 24 V switch mode power supplies without tripping fast and thus prevents disastrous voltage dips of the supply. It works with a single trip curve for all loads. Even capacitive loads up to 75,000 µF can be handled very easily. Besides fixed current ratings from 0.5 A to 12 A, adjustable current rating versions are also available. The integral fail-safe element (fuse) is adjusted to the circuit protector’s rated current and can thus very easily be synchronised with the wired cable cross section. This makes planning much easier.

Features

- Track-mountable
- Active linear current limitation
- Capacitive loads up to 75,000 µF
- ESX10-TA/-TB: fixed current ratings 0.5 A...12 A
- ESX10-TD: adjustable current ratings, e.g. [0.5 A / 1 A / 2 A]; [2 A / 4 A / 6 A]; [6 A / 8 A / 10 A]
- Approvals: UL, CSA, GL
- OPTION: Control inputs, signalling
- OPTION: ATEX approval

Your benefits

- Increases machine uptime through clear failure detection and stable power supply
- Reduces downtimes through quick fault resolution
- Simplifies planning through clear sizes and ratings
- Saves costs and time through fast and flexible mounting including integral power distribution solution

Preferred types – for more details on all configurations please see order numbering code

Preferred types are E-T-A products most frequently used by E-T-A customers. We manufacture E-T-A preferred types in particularly high volumes. Our preferred types are supplied at shorter lead times than non-standard versions.

<table>
<thead>
<tr>
<th>Preferred types</th>
<th>Short description</th>
<th>Preferred ratings (A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESX10-TA/-TB</td>
<td>fixed current rating</td>
<td>0.5 1 2 3 4 6 8 10 12 0.5/1/2 2/4/6 6/8/10</td>
</tr>
<tr>
<td>ESX10-TA-100-DC24V-</td>
<td>without auxiliary contacts</td>
<td>• • • • • • • • •</td>
</tr>
<tr>
<td>ESX10-TB-100-DC24V-</td>
<td>auxiliary contact “make contact”</td>
<td>• • • • • • • • •</td>
</tr>
<tr>
<td>ESX10-TD</td>
<td>adjustable current rating</td>
<td>0.5 1 2 3 4 6 8 10 12 0.5/1/2 2/4/6 6/8/10</td>
</tr>
<tr>
<td>ESX10-TD-101-DC24V-</td>
<td>auxiliary contact “make contact”</td>
<td>– – – – – – – – –</td>
</tr>
</tbody>
</table>

Approvals

For access to the latest documents please follow: [http://www.e-t-a.de/qr1006/](http://www.e-t-a.de/qr1006/)

Compliances

RoHS ✔ REACH
### Technical data (T_{amb} = 25 °C, U_B = DC 24 V)

#### Operating data
- **Operating voltage** U_B: DC 24 V (18...32 V)
- **Current ratings** I_N:
  - fixed rating:
    - Types ESX10-TA-... and -TB-...:
      - 0.5 A, 1 A, 2 A, 3 A, 4 A, 6 A, 8 A, 10 A, 12 A
  - adjustable current ratings:
    - type ESX10-TD-...:
      - [0.5 A/1 A/2 A], [2 A/4 A/6 A], [6 A/8 A/10 A]
- **Standby current** I_0: in ON condition: typically 20 ... 30 mA depending on signal output

#### Visual status indication via
- multicoloured LED:
  - **green**: device is ON (S1 = ON) / load circuit/Power-MOSFET connected
  - **orange**: overload or short circuit until electronic disconnection
  - **red**: device switched OFF electronically / load circuit/Power-MOSFET disconnected
- **status output F** (optional)
- **potential-free signal contact** F (optional)
- **On/off position of the switch S1**

#### Load circuit
- **Load output**: power MOSFET switching output (plus switching)
- **Overload disconnection** (OL) typically 1.1 x I_N (1.05...1.35 x I_N)
- **Short circuit current** I_K:
  - active current limitation with \( I_{\text{limit}} = \text{typically} 1.8/1.5/1.4/1.3 \times I_N \), \( I_{\text{limit}} \) depending on I_N
  - (typically \( I_{\text{limit}} \) values, see table 1)
- **Trip times**:
  - see time/current characteristic
  - **Trip thresholds/Time times** (t_1, t_2) at overcurrent (\( I_{\text{limit}} \) see table 1)
  - 1. threshold:
    - at I_{load} > typically 1.1 x I_N...1.0 x \( I_{\text{limit}} \):
      - \( t_1 \) = typically 3 s
  - 2. threshold:
    - at I_{load} = \( I_{\text{limit}} \):
      - \( t_2 \) = typically 100 ms...3 s
- **Temperature disconnection**:
  - internal temperature monitoring with electronic disconnection
- **Low voltage monitoring of load output** with hysteresis, no reset required
  - load “OFF” at U_B < 8 V
- **Switch-on delay** t_{start} after applying of U_B:
  - typically 0.5 s after each ON operation, after reset and disconnection of load circuit

#### Electrical data
- **Free-wheeling diode**:
  - external free-wheeling diode recommended for inductive load
- **Parallel connection of several load outputs** not permitted
- **Signal output F**:
  - ESX10-T.-101/-102
- **Electrical data**:
  - potential-free auxiliary change-over contact max. DC 30 V/0.5 A min. 10 V/10 mA
- **Standard condition**:
  - U_B is applied and switch S1 is ON and no overload, no short circuit
- **OFF condition, LED off**:
  - device switched off (switch S1 to OFF)
  - no operating voltage U_B
- **Fault condition LED orange**:
  - overload conditions > 1.1 times I_N until electronic disconnection
- **Fault condition LED red**:
  - device switched OFF (switch S1 to OFF)
  - electronic disconnection after overload or short circuit
- **ESX10-TB-101** single signal, make contact
  - contact open, terminal 13-14
- **ESX10-TB-102** single signal, make contact
  - contact closed, terminal 11-12
- **Error** signal output is in fault condition, if:
  - there is no operating voltage U_B
  - the ON/OFF switch S1 is in OFF position
  - the red LED is lighted (electronic disconnection)
- **Status output SF**:
  - ESX10-T.-114/-124/-127
  - plus switching signal output, connects U_B to pin 23
  - Current ratings: DC 24 V/ max. 0.2 A (short circuit proof)
  - The status output is connected internally with a 10 kOhm resistor against 0 V.
  - **Status OUT**:
    - ESX10-TB-114/-124 (signal status OUT), at U_B = + 24 V
      - + 24 V = S1 is ON, load output locked
      - red LED lighted.
    - ESX10-TB-127 (signal status OUT inverted), at U_B = + 24 V
      - 0 V = S1 is ON, load output connected and/or switch S1 is OFF
  - **OFF condition**:
    - 0 V level at status output whenever:
      - switch S1 is in ON position, but device is still in ON delay
      - switch S1 in OFF position, or control signal OFF, device is switched off
      - No operating voltage U_B
  - **Reset input RE**:
    - ESX10-T.-124/-127
  - Electrical data:
    - voltage max. DC 32 V
    - High > DC 8 V ≤ DC 32 V
    - Low < DC 3 V > 0 V
    - current consumption typically 2.6 mA (DC 24 V)
    - min. pulse duration 10 ms
**Technical data**  \( (T_{\text{amb}} = 25 \degree \text{C}, U_B = \text{DC 24 V}) \)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset signal RE terminal 22</td>
<td>with the falling edge of a + DC 24 V pulse the electronically blocked ESX10-TB-124/-127 can be reset via an external momentary switch. A joint reset signal can also be applied to more than one device at a time. Devices in ON condition will remain unaffected.</td>
</tr>
<tr>
<td>Control input ( I_{\text{IN}} )</td>
<td><strong>ESX10-T-114</strong></td>
</tr>
<tr>
<td>Control signal ( I_{\text{IN}} ) by a Terminal 21</td>
<td>24 V level (HIGH): device is switched on remote ON/OFF signal. 0 V level (LOW) device is switched off by a remote ON/OFF signal.</td>
</tr>
<tr>
<td>Switch S1 ON/OFF a HIGH level is applied to ( I_{\text{IN}} )</td>
<td>device can only be S1 switched on when ( I_{\text{IN}} )</td>
</tr>
</tbody>
</table>
| LED indication | ON: LED green 
OFF: LED red |
| General data | |
| Fail-safe element | back-up fuse for ESX10-T not required, due to an integral redundant fail-safe element (protective element) |
| Terminals | **LINE+ / LOAD+ / 0V** |
| Screw terminals | M4 |
| max. cable cross section | 0.5 - 16 mm² |
| rigid and flexible | |
| flexible with wire end ferrule w/wo plastic sleeve | 0.5 mm – 10 mm² |
| stripping length | 10 mm |
| tightening torque (EN60934) | 1.5 - 1.8 Nm |
| multi-lead connection (2 identical cables) rigid / flexible | 0.5 – 4 mm² |
| flexible with wire end ferrule without plastic sleeve | 0.5 – 2.5 mm² |
| flexible with TW/N wire end ferrule with plastic sleeve | 0.5 – 6 mm² |
| Terminals signal terminals | |
| Screw terminals | M3 |
| max. cable cross section | 0.25 – 2.5 mm² |
| flexible with wire end ferrule w/wo plastic sleeve | 8 mm |
| stripping length | 8 mm |
| tightening torque (EN60934) | 0.5 - 0.6 Nm |
| Housing material | moulded |
| Mounting | symmetrical rail to EN 60715-35x7.5 |
| Ambient temperature | -25 to 60 °C ¹ |
| (without condensation, cf. EN 60204-1) ambient temperature range can differ depending on approvals. |
| Storage temperature | -40 to 70 °C |
| Humidity | 96 hrs / 95% RH 40°C to IEC 60068-2-78, test Cab climate class 3K3 to EN60721 |
| Vibration | 3g test to IEC 60068-2-6, test Fc |
| Protection class | housing IP20 EN60529 terminals IP20 DIN 60529 |

**Technical data**  \( (T_{\text{amb}} = 25 \degree \text{C}, U_B = \text{DC 24 V}) \)

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</table>
| EMC requirements | noise emission EN 61000-6-3 
noise immunity: EN 61000-6-2 |
| Insulation co-ordination | 0.5 kV / pollution degree 2 
reinforced insulation at operating area |
| Dielectric strength | max. DC 32 V (load circuit) |
| Insulation resistance (OFF condition:) | r/a, only electronic disconnection |
| Conformity | CE marking to 2014/30/EU |
| Dimensions (w x h x d) | 12.5 x 80 x 83 mm |
| Mass | approx. 65 g |
Electronic Circuit Protector ESX10-T.-DC 24 V

Preferred types

Preferred types are E-T-A products most frequently used by E-T-A customers. We manufacture E-T-A preferred types in particularly high volumes. Our preferred types are supplied at shorter lead times than non-standard versions.

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<td>0.5 1 2 3 4 6 8 10 12 0.5/1/2 2/4/6 6/8/10</td>
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<td>without auxiliary contacts</td>
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</tr>
<tr>
<td>ESX10-TB-101-DC24V-</td>
<td>&quot;make contact&quot;</td>
<td>* * * * * * * * * *</td>
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<td>ESX10-TD-101-DC24V-</td>
<td>&quot;make contact&quot;</td>
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Order numbering code

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<td>ESX10-TD-101-DC24V-</td>
<td>&quot;make contact&quot;</td>
<td>- - - - - - - - * *</td>
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Ordering number code for ATEX version ...-E

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<tbody>
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</tr>
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<td>ESX10-TA-100-DC24V-</td>
<td>without auxiliary contacts</td>
<td>* * * * * * * * * *</td>
</tr>
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<td>ESX10-TB-101-DC24V-</td>
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<td>adjustable current rating</td>
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<tr>
<td>ESX10-TD-101-DC24V-</td>
<td>&quot;make contact&quot;</td>
<td>- - - - - - - - * *</td>
</tr>
</tbody>
</table>

Ordering example

ESX10 -TB - 1 0 1-DC 24 V - 6 A - E ordering example

Caution!
Please observe separate data sheet for ESX10-TB-101-DC 24 V-16 A.

Description of ESX10-T signal inputs /outputs see wiring diagrams.

Custom designed versions

Looking for a version you cannot find in our ordering number code? Please get in touch. We will be pleased to find a solution for you.
Table 1: Voltage drop, current limitation, max. load current

<table>
<thead>
<tr>
<th>current rating $I_N$</th>
<th>typical voltage drop $U_{ON}$ at $I_N$</th>
<th>active current limitation $I_{limit}$ (typically)</th>
<th>max. load current at 100% ON duty, $U_D$ DC 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 A</td>
<td>70 mV</td>
<td>1.8 x $I_N$</td>
<td>0.5 A</td>
</tr>
<tr>
<td>1 A</td>
<td>80 mV</td>
<td>1.8 x $I_N$</td>
<td>1 A</td>
</tr>
<tr>
<td>2 A</td>
<td>130 mV</td>
<td>1.8 x $I_N$</td>
<td>2 A</td>
</tr>
<tr>
<td>3 A</td>
<td>80 mV</td>
<td>1.8 x $I_N$</td>
<td>3 A</td>
</tr>
<tr>
<td>4 A</td>
<td>100 mV</td>
<td>1.8 x $I_N$</td>
<td>4 A</td>
</tr>
<tr>
<td>6 A</td>
<td>130 mV</td>
<td>1.8 x $I_N$</td>
<td>6 A</td>
</tr>
<tr>
<td>8 A</td>
<td>120 mV</td>
<td>1.5 x $I_N$</td>
<td>8 A</td>
</tr>
<tr>
<td>10 A</td>
<td>150 mV</td>
<td>1.5 x $I_N$</td>
<td>10 A</td>
</tr>
<tr>
<td>12 A</td>
<td>180 mV</td>
<td>1.3 x $I_N$</td>
<td>12 A</td>
</tr>
<tr>
<td>[0.5/1/2 A]</td>
<td>70/80/130 mV</td>
<td>1.4 x $I_N$</td>
<td>0.5/1/2 A</td>
</tr>
<tr>
<td>[2/3/4 A]</td>
<td>130/80/100 mV</td>
<td>1.4 x $I_N$</td>
<td>2/3/4 A</td>
</tr>
<tr>
<td>[2/4/6 A]</td>
<td>130/100/130 mV</td>
<td>1.4 x $I_N$</td>
<td>2/4/6 A</td>
</tr>
<tr>
<td>[8/8/10 A]</td>
<td>130/120/150 mV</td>
<td>1.4 x $I_N$</td>
<td>8/8/10 A</td>
</tr>
</tbody>
</table>

Note:
When mounted side-by-side without convection, the devices can only carry max. 80 % of their rated current continuously (100 % ON duty) due to the thermal effect.

Table 2: ESX10-T – product versions

<table>
<thead>
<tr>
<th>Version</th>
<th>Signal input</th>
<th>Signal output</th>
<th>Status output SF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESX10-..</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-TA</td>
<td>-100</td>
<td>x</td>
<td>–</td>
</tr>
<tr>
<td>-TB/-TD</td>
<td>-101</td>
<td>x</td>
<td>–</td>
</tr>
<tr>
<td>-TB/-TD</td>
<td>-102</td>
<td>x</td>
<td>–</td>
</tr>
<tr>
<td>-TB/-TD</td>
<td>-114</td>
<td>–</td>
<td>x</td>
</tr>
<tr>
<td>-TB/-TD</td>
<td>-124</td>
<td>–</td>
<td>x</td>
</tr>
<tr>
<td>-TB/-TD</td>
<td>-127</td>
<td>–</td>
<td>x</td>
</tr>
</tbody>
</table>

Notes:
- The user has to ensure that the cable cross section of the load circuit in question complies with the current rating of the ESX10-T used.
- In addition special precautions have to be taken in the system or machinery to exclude automatic re-start (e.g. by using a safety PLC) (cf. Machinery Directive 2006/42/EG und EN 60204-1, Safety of Machinery). In the event of a failure (short circuit/overload) the load circuit will be disconnected electronically by the ESX10-T.
# Approvals

## ESX10-TA/-TB und -TD

<table>
<thead>
<tr>
<th>Approval authority</th>
<th>Standard</th>
<th>File-Certificate Nr.</th>
<th>Voltage rating</th>
<th>Current rating range</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL</td>
<td>UL 2367</td>
<td>E306740</td>
<td>DC 24 V</td>
<td>0.5 A...16 A</td>
</tr>
<tr>
<td>UL</td>
<td>ISA 12.12.01-2015 (Class I, Division 2, Groups A, B, C, D)</td>
<td>E320024</td>
<td>DC 24 V</td>
<td>0.5 A...12 A</td>
</tr>
<tr>
<td>UL</td>
<td>UL 508 C22.2 No 14</td>
<td>E322549</td>
<td>DC 24 V</td>
<td>0.5 A...16 A</td>
</tr>
<tr>
<td>DNV GL</td>
<td>Rules VI, part 7. GL 2012, category C, EMC1</td>
<td>4676212 HH</td>
<td>DC 24 V</td>
<td>0.5 A...12 A</td>
</tr>
</tbody>
</table>

## ESX10-TA und -TB

<table>
<thead>
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<th>Voltage rating</th>
<th>Current rating range</th>
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</thead>
<tbody>
<tr>
<td>CSA</td>
<td>C22.2 No 14</td>
<td>016186</td>
<td>DC 24 V</td>
<td>0.5...12 A</td>
</tr>
<tr>
<td></td>
<td>C22.2 No 142M</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C22.2 No 213-M (Class I, Division 2)</td>
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</tr>
<tr>
<td>TÜV</td>
<td>ATEX 2014/34/EU Annex VIII</td>
<td>EX8111077862003</td>
<td>DC 24 V</td>
<td>0.5...12 A</td>
</tr>
<tr>
<td></td>
<td>EN 60079-0</td>
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<tr>
<td></td>
<td>EN 60079-11</td>
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<tr>
<td></td>
<td>EN 60079-15</td>
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</table>

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# Declaration of Conformity for ATEX version ESX10-TA/-TB-...-E

**E-T-A Elctrotechnische Apparate GmbH**

**EU-Konformitätserklärung** Nr. 100.218.1019-04

**Declaration of Conformity**

Wir, E-T-A Elctrotechnische Apparate GmbH, 
Wiz., Industriestraße 2-8, D-09518 Altdorf, Germany 

(Company name and address)

erklären im alleinigen Verantwortung, dass das Produkt 

ESX10-TA/-TB-...-E 

(haushaldenmontage 24VDC / rot marktung (Haushalt)) 

(haushaldenmontage 24VAC / rot marktung (Haushalt)) 

(Steckmontage, mit Modul 1TPU, 24VDC, plug-in mounting mit modul 1TPU, 24VDC) 

ESX10-TC-...-E 

(haushaldenmontage 24VDC / rot marktung (Haushalt)) 

(haushaldenmontage 24VDC / rot marktung (Haushalt)) 

auf dass diese Erklärung bezieht, mit den wesentlichen Anforderungen folgender Richtlinie(n) übereinstimmt:

- EN 60079-0/2012 +A11/2013
- EN 60079-11:2010
- EN 60079-15:2010 - Explosionsarten und -schutz für die elektrische Warme - Grundlagen und allgemeine Anforderungen
- EN 60079-15:2010 - Explosionsarten und -schutz für die elektrische Warme - Grundlagen und allgemeine Anforderungen

Weiterhin erfüllt das Produkt folgende Normen(n) und/oder normative Dokumente(n):

- EN 60079-0/2012 +A11/2013
- EN 60079-11:2010
- EN 60079-15:2010

Die Erklärung und die Erklärungserklärung folgen der federrechtlichen Anforderungen der neuem EN 60204-1:2016 - Allgemeine Anforderungen - Allgemeine Anforderungen.

Zur Beurteilung der Übereinstimmung wurden(n) folgende Normen(n) und/oder normative Dokumente(n) herangezogen:

- EN 60079-0/2012 +A11/2013
- EN 60079-11:2010
- EN 60079-15:2010

Die Erklärung und die Erklärungserklärung folgen der federrechtlichen Anforderungen der neuem EN 60204-1:2016 - Allgemeine Anforderungen - Allgemeine Anforderungen.

Unterschrift: 

Ergänzungen: 

Dr. Olaf Seif 

Manager 

E-T-A Elctrotechnische Apparate GmbH 

Altdorf, 12. April 2017
Dimensions ESX10-TA

Dimensions ESX10-TB

Dimensions ESX10-TD

Information on UL and CSA approvals

ESX10-TA/-TB/-TD
UL2367
Non-hazardous use - UL File # E306740

UL 508
Non-hazardous use
UL File # E322549

E322549
INDUSTRIAL CONTROL EQUIPMENT

ESX10-TA / -TB
ISA 12.12.01-2015
UL File # E320024

Operating Temperature Code T4
- This equipment is suitable for use in Class I, Division 2,
Groups A, B, C and D or non-hazardous locations only.
T4 A / 0°C to 50°C

Warning
- Exposure to some chemicals may degradable the sealing properties
of materials used in the following device: relay (K1)
  • Sealant Material:
    Generic Name: Modified diglycidyl ether of bisphenol A
    Supplier: Fine Polymers Corporation
    Type: EpiFine 4616L-160PK
  • Casing Material:
    Generic Name: Liquid Crystal Polymer
    Supplier: Sumitomo Chemical
    Type: E4008, E4009, or E6008

RECOMMENDATION:
- Periodically inspect the device named above for any degradation
  of properties and replace if degradation is found

WARNING – EXPLOSION HAZARD:
AVERTISSEMENT – RISQUE D’EXPLOSION
- Do not disconnect equipment unless power has been removed
  or the area is known to be non-hazardous.
Avant de deconnecter l’equipment, couper le courant ou
s’assurer que l’emplacement est designe non dangereux.
- Substitution of any components may impair suitability for
Class I, Division 2.
La substitution de composants peut rendre ce materiel
inaceptable pour les emplacements de class I, division 2.

This device is OPEN type equipment that must be used within a suita-
ble end-use system enclosure, the interior of which is accessible only
through the use of a tool. The suitability of the enclosure is subject
to investigation by the local Authority Having Jurisdiction at the time
of installation.

Wiring to or from this device, which enters or leaves the system
enclosure, must utilize wiring methods suitable for Class I, Division 2
Hazardous Locations, as appropriate for the installation.

ESX10-TA / -TB
CSA C22.2 No: 14 - File # 016186
CSA C22.2 No: 142 - File # 016186
CSA C22.2 No: 213 (Class I, Division 2) - File # 016186

Class 2
Meets requirement for Class 2 current limitation
(ESX10-T...-0.5 A / 1 A / 2 A / 3 A)
ESX10-T signal inputs / outputs / (wiring diagrams)

**ESX10-TA-100**
without signal input/output

**ESX10-TB-101**
without signal input with signal output F (single signal, N/O)

**ESX10-TB-102**
without signal input with signal output F (single signal, N/C)

**ESX10-TB-114**
with control input IN+ (+DC 24 V)
with status output SF (+24 V = load output ON)

**ESX10-TB-124**
with reset input RE (+DC 24 V)
with status output SF (+24 V = load output ON)

**ESX10-TB-127**
with reset input RE (+DC 24 V)
with inverse status output SF (0 V = load output ON)

**ESX10-TD**
Wiring diagram similar to ESX10-TB without busbars (on the front)
Typical time/current characteristic (T_{amb} = 25 °C)

- In a range of 1.1...1.8 x I_N the trip time is typically 3 s. (e.g. ESX10-TB-...-6 A)
- The electronic current limitation typically begins in at 1.8 x I_N. This means: under all overload conditions (independent of power supply and load circuit resistance) typically 1.8 times rated current is applied until disconnection. The corresponding current limitation value I_{Limit} depends on the current rating of the device I_N (see table 1). The trip time varies between 100 ms and 3 s depending on the multiple of the current rating or at short circuit (I_K).
- Without the current limitation getting into effect at typically 1.8 x I_N there would be a much higher overcurrent in the event of an overload or short circuit.

Table 3: Reliable disconnection of the ESX10-T

<table>
<thead>
<tr>
<th>cable cross section A in mm²</th>
<th>0.14</th>
<th>0.25</th>
<th>0.34</th>
<th>0.5</th>
<th>0.75</th>
<th>1</th>
<th>1.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>distance L in metres (= one-way length)</td>
<td>0.14</td>
<td>0.25</td>
<td>0.34</td>
<td>0.5</td>
<td>0.75</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>5</td>
<td>1.27</td>
<td>0.71</td>
<td>0.52</td>
<td>0.36</td>
<td>0.24</td>
<td>0.18</td>
<td>0.12</td>
</tr>
<tr>
<td>10</td>
<td>2.54</td>
<td>1.42</td>
<td>1.05</td>
<td>0.71</td>
<td>0.47</td>
<td>0.36</td>
<td>0.24</td>
</tr>
<tr>
<td>15</td>
<td>3.81</td>
<td>2.14</td>
<td>1.57</td>
<td>1.07</td>
<td>0.71</td>
<td>0.53</td>
<td>0.36</td>
</tr>
<tr>
<td>20</td>
<td>5.09</td>
<td>2.85</td>
<td>2.09</td>
<td>1.42</td>
<td>0.95</td>
<td>0.71</td>
<td>0.47</td>
</tr>
<tr>
<td>25</td>
<td>6.36</td>
<td>3.56</td>
<td>2.62</td>
<td>1.78</td>
<td>1.19</td>
<td>0.89</td>
<td>0.59</td>
</tr>
<tr>
<td>30</td>
<td>7.63</td>
<td>4.27</td>
<td>3.14</td>
<td>2.14</td>
<td>1.42</td>
<td>1.07</td>
<td>0.71</td>
</tr>
<tr>
<td>35</td>
<td>8.90</td>
<td>4.98</td>
<td>3.66</td>
<td>2.49</td>
<td>1.66</td>
<td>1.25</td>
<td>0.83</td>
</tr>
<tr>
<td>40</td>
<td>10.17</td>
<td>5.70</td>
<td>4.19</td>
<td>2.85</td>
<td>1.90</td>
<td>1.42</td>
<td>0.95</td>
</tr>
<tr>
<td>45</td>
<td>11.44</td>
<td>6.41</td>
<td>4.71</td>
<td>3.20</td>
<td>2.14</td>
<td>1.60</td>
<td>1.07</td>
</tr>
<tr>
<td>50</td>
<td>12.71</td>
<td>7.12</td>
<td>5.24</td>
<td>3.56</td>
<td>2.37</td>
<td>1.78</td>
<td>1.19</td>
</tr>
<tr>
<td>75</td>
<td>19.07</td>
<td>10.68</td>
<td>7.85</td>
<td>5.34</td>
<td>3.56</td>
<td>2.67</td>
<td>1.78</td>
</tr>
<tr>
<td>100</td>
<td>25.34</td>
<td>14.24</td>
<td>10.47</td>
<td>7.12</td>
<td>4.75</td>
<td>3.56</td>
<td>2.37</td>
</tr>
<tr>
<td>125</td>
<td>31.79</td>
<td>17.80</td>
<td>13.09</td>
<td>8.90</td>
<td>5.93</td>
<td>4.45</td>
<td>2.97</td>
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<tr>
<td>150</td>
<td>38.14</td>
<td>21.36</td>
<td>15.71</td>
<td>10.68</td>
<td>7.12</td>
<td>5.34</td>
<td>3.56</td>
</tr>
<tr>
<td>175</td>
<td>44.50</td>
<td>24.92</td>
<td>18.32</td>
<td>12.46</td>
<td>8.31</td>
<td>6.23</td>
<td>4.15</td>
</tr>
<tr>
<td>200</td>
<td>50.86</td>
<td>28.48</td>
<td>20.94</td>
<td>14.24</td>
<td>9.49</td>
<td>7.12</td>
<td>4.75</td>
</tr>
<tr>
<td>225</td>
<td>57.21</td>
<td>32.04</td>
<td>23.56</td>
<td>16.02</td>
<td>10.68</td>
<td>8.01</td>
<td>5.34</td>
</tr>
<tr>
<td>250</td>
<td>63.57</td>
<td>35.60</td>
<td>26.18</td>
<td>17.80</td>
<td>11.87</td>
<td>8.90</td>
<td>5.93</td>
</tr>
</tbody>
</table>

Example 1:
max. distance at 1.5 mm² and 3 A -> 214 m
Example 2:
max. distance at 1.5 mm² and 6 A -> 106 m
Example 3:
mixed wiring:
R1 = 40 m in 1.5mm² 2 and R2 = 5 m in 0.25mm²:
(control cabinet - sensor/actuator level)R1 = 0.95 Ohm, R2 = 0.71 Ohm
Total (R1 + R2) = 1.66 Ohm
Mounting examples for ESX10-T

Description of installation:
With a block of devices the busbars have to be inserted before wiring. Max. 10 plug-in cycles for busbars allowed.

Recommendation:
The line entry busbars and signal busbars should be interrupted after 10 devices and line entry should start anew.

Table of busbar lengths
(X 222 611 02 and X 222 005 03 or their cut lengths - see accessories)

<table>
<thead>
<tr>
<th>Number of devices</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of rail</td>
<td>22</td>
<td>34.5</td>
<td>47</td>
<td>59.5</td>
<td>72</td>
<td>84.5</td>
<td>97</td>
<td>109.5</td>
<td>122</td>
</tr>
<tr>
<td>[mm] ± 0.5 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Connection diagrams and application examples ESX10-T...

Signal contacts are shown in OFF or fault condition.

**ESX10-TA-100**

- Line entry
- 2 LOAD+ 3 0V
- 1 LINE+ 1
- +24V
- 0V

**ESX10-TB-101**

Group signalling (series connection)

- Line entry
- 2 LOAD+ 3 0V
- 1 LINE+ 1
- +24V
- 0V

**ESX10-TB-101**

Group signalling by means of an signal lamp

Jumpers (X 222 005 13) are staggered

0 V busbar (X 222 611 02 or X 222 611 xx)

**ESX10-TA-100**

LINE+ busbar (X 222 611 02 or X 222 611 xx)
Wiring diagrams, application examples ESX10-T

**ESX10-TB-102**
Single signalling with common line entry

**ESX10-TB-124**
Single signalling with common reset
**Wiring diagrams, application examples ESX10-T**

**Applications examples: line entry DC 24 V with protection of signal circuit and direct connection of loads**

Auxiliary contacts are shown on the OFF of fault condition

**ESX10-TB-101**

Group signalisation (series connection)

Type ESX10-TA-100-DC24V-0.5A can be used as a supply module including protection of auxiliary circuit

Optional: passive supply module AD-TX-EM01 (without protection)

**ESX10-TB-102**

Single signalisation with common line entry

Type ESX10-TA-100-DC24V-0.5A can be used as a supply module including protection of auxiliary circuit

Optional: passive supply module AD-TX-EM01 (without protection)
## Description

The ESX10-T has an integral power distribution system. The following wirings can be carried out with different plug-in type busbars:

- **LINE + (DC 24 V)**
- **0 V**
  - **Important:** The electronic devices ESX10-T require a 0 V connection.
- **Auxiliary contacts**
- **Reset inputs**

## Accessories

### Busbars for LINE + and 0 V

- **ampacity with one input** \( I_{\text{max}} = 50 \text{ A} \)
  - (recommendation: central supply)
- **ampacity with two inputs** \( I_{\text{max}} = 63 \text{ A} \)
  - grey insulated, length: 500 mm
  - part no. X 222 611 02

### Signal busbars for aux. contacts and reset inputs

- **ampacity with one input** \( I_{\text{max}} = 1 \text{ A} \)
  - suitble for signal busbars ESX10-TB-...
- **ampacity with aux. contacts connected in series** \( I_{\text{max}} = 0.5 \text{ A} \)
  - grey insulated, length: 500 mm
  - part no. X 222 005 03

### Busbars for auxiliary contacts

- **grey insulated**
- max. 10 plug-in cycles allowed
  - part no. X 222 005 13
  - Packaging unit: 10 pcs

### Insulated wire bridge (for aux. contact)

- optional as jumper for ESX10-TB-101.../ESX10-TD-101...
- for group signalling
  - (series connection of make contacts 13 - 14)
- part no. X 223 108 01
  - Packaging unit: 10 pcs

### Connector bus link – K10

- suitable for auxiliary contacts (series connection)
- X 210 589 02 (1.5 mm², brown)
**Accessories**

**Passive supply module for LINE+ and 0 V (without protection)**

- **Ampacity:** $I_{\text{max}} = 50$ A
- Max. cable cross section see ESX10-T
- **Part no.:** AD-TX-EM01

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**Labels, pack of 10**

- Suitable for ESX10-TD, cover of current rating adjustment
- Y 309 705 11 (0.5 A, 1 A, 2 A)
- Y 309 705 12 (2 A, 4 A, 6 A)
- Y 309 705 13 (6 A, 8 A, 10 A)
- Y 309 705 14 (2 A, 3 A, 4 A)

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**Labels, pack of 30**

- Suitable for ESX10-TD, cover of current rating adjustment
- Y 309 705 21 (0.5 A)
- Y 309 705 22 (1 A)
- Y 309 705 23 (2 A)
- Y 309 705 24 (3 A)
- Y 309 705 25 (4 A)
- Y 309 705 26 (6 A)
- Y 309 705 27 (8 A)
- Y 309 705 28 (10 A)

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**ESX10-TD-, Application example of adhesive label**

- Switch for current rating adjustment
- Cover label with adjusted rating, e.g. 4 A
- See accessories

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