

## Description

The 18plus-**ControlPlex**® intelligent power distribution system offers the option, in connection with the CPC20 controller, to accommodate up to sixteen double-channel ESX60D electronic circuit protectors and to enable communication. It enables read-out of the electronic circuit protectors' status, their corresponding operation data such as the present load current and the load voltage and it enables control and parameterising of the devices.

In addition the CPC20 ensures the connection between the circuit protectors and superordinate control level by means of the integral field bus interface. Its internal **ELBus**® interface allows realisation of the connection to the power distribution boards and the plugged-in ESX60D electronic circuit protectors. Up to two **ELBus**® interfaces are available. With an additional **ELBus**® interface, the bus Controller CPC20 can be used for a second power distribution system type 18plus ControlPlex. The CPC20 allows entire access on all required parameters of the electronic circuit protectors, their control unit and the visualisation of the device data.

The combination of CPC20 with the power distribution system 18plus-**ControlPlex**® and the plugged in ESX60D electronic circuit protectors offers a fully parameterisable protection of the DC 24 V circuits and ensures the selective overcurrent protection of sensors and actuators, of decentralised peripheral sub-assemblies etc. and their supply cables.

It is therefore an ideal system to use in machine construction and process control, in the chemical, pharmaceutical and foodstuffs industry, in building automation, steel production and car manufacturing. It reduces wiring time, increases system availability and enhances diagnostic functions.

The module 18plus-**ControlPlex**® holds a complete mounting and power distribution system for DIN rail mounting which has, together with the busbars, a fully-featured 80 A power distribution DC 24 V control voltage without additionally required terminals and connection lines.

All electrical connections are made by means of push-in terminals with the following properties:

- All conductors can be plugged in easily and without tools
- Reliable contact making
- Firm connection of the conductors due to high pull-out forces
- Ease of operation with any tool
- Contact reliability in the event of shock and vibration
- Gas-tight connection
- Maintenance-free

All pushers were designed in four different colours (red, blue, orange, grey) so as to easily distinguish the different voltage potentials and functions of the device.

red = supply 24 V/LINE+ or protected load output/LOAD+  
 blue = supply power supply 0 Volt or load/0 Volt  
 orange = supply system FE (functional earth) or load/FE  
 grey = ELBus terminals 15 ELB; 16 ADR; 18 GND

### Suitable for the following types:

Controller	<b>CPC20</b>
Electronic circuit protector	<b>ESX60D</b> (completely parameterisable by means of CPC20)



**Module 18plus-ControlPlex®**

## Features

- Space-saving wiring method for load and data lines
- For professional electric planning and design work in the future
- Ideal for all control cabinets and switch boxes with ongoing decentralisation of the entire automation technology
- Compact design, significant cost reduction for the whole power distribution including wiring in the control cabinet
- Holds a complete installation and power distribution system for symmetrical rail mounting.
- Together with the busbars it holds a fully-fledged 80 A potential distribution of the DC 24 V control voltage without additionally required connection terminals or connecting cables
- Line entry of the DC 24 V supply for LINE+, 0 Volt and functional earth FE is by means of plug-in type busbars.
- Bus connection for **ControlPlex**® applications

## Your benefits

- Flexible plant design by means of are Module
- Compact and Clear cable concept through a clear assignment of channels
- Cost reduction through quick wiring and low stockkeeping

## CE marking



Technical data	
<b>Plug-in type circuit protectors</b>	ESX60D
<b>Rated voltage</b>	DC 24 V
<b>Rated insulation voltage</b>	AC 250 V
<b>Main circuit, rated current <math>I_N</math> supply module</b>	80 A (IEC 60947-7-1/-2)
<b>Connection module</b>	20 A (IEC 60947-7-1/-2)
<b>Busbar for power distribution</b>	$I_{max}$ 80 A
<b>Insulated busbar</b>	
<b>Reference ambient temperature</b>	-25° C ... +60° C
<b>Mounting ambient temperature</b>	+5° C ... +60° C
<b>Storage temperature</b>	-40° C ... +70° C
<b>Mounting position</b>	any
<b>Creepage resistance</b>	CTI 600
<b>Mounting method</b>	symmetrical rail EN 50022-35x7.5 symmetrical rail EN 50022-35x15/1.5
<b>Supply module EM supply terminals (1, 3, 4)</b>	Push-in terminal PT 16 0.5 – 16 mm <sup>2</sup> rigid (without wire end ferrule AWG 20 – 6; 0.5 – 16 mm <sup>2</sup> flexible (without wire end ferrule AWG 20 – 6; 0.5 – 16 mm <sup>2</sup> flexible with wire end ferrule* without plastic sleeve 0.5 – 16 mm <sup>2</sup> flexible with wire end ferrule* with plastic sleeve
<b>supply terminals (15, 16, 18)</b>	Push-in terminal PT 4 0.2 – 6 mm <sup>2</sup> rigid (without wire end ferrule AWG 24 – 12; 0.2 – 4 mm <sup>2</sup> flexible (without wire end ferrule AWG 24 – 12; 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* without plastic sleeve 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* with plastic sleeve

Technical data	
<b>AM connection module terminals (2.1; 2.2; 3.1; 3.2; 4.1; 4.2)</b>	Push-in terminal PT 4 0.2 – 6 mm <sup>2</sup> rigid (without wire end ferrule AWG 24 – 12 0.2 – 4 mm <sup>2</sup> flexible (without wire end ferrule AWG 24 – 12 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* without plastic sleeve 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* with plastic sleeve
<b>TM connection module terminals (15: 16: 18)</b>	push-in terminal PT 4 0.2 – 6 mm <sup>2</sup> rigid (without wire end ferrule) AWG 24 – 12 0.2 – 4 mm <sup>2</sup> flexible (without wire end ferrule AWG 24 – 12 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* without plastic sleeve 0.25 – 4 mm <sup>2</sup> flexible with wire end ferrule* with plastic sleeve
<b>Wire stripping length</b>	
<b>Push-in terminal PT 16</b>	18 mm
<b>Push-in terminal PT 4</b>	11 mm
*) Application note: When using wire end ferrules we recommend a square-shaped crimp	
<b>Typical electrical operational values</b>	
<b>Insulation coordination (IEC 60664-1)</b>	
main circuit	rated impulse voltage 4 kV overvoltage category III pollution degree 3
ELBUS/ADR/0 V	rated impulse voltage 4 kV overvoltage category III pollution degree 3
<b>Dielectric strength</b>	
main circuit to main circuit	1,500 V
main circuit to ELBUS/ADR/0 V	1,500 V
ELBUS/ADR/ 0 V to ELBUS/ADR/ 0 V	450 V
<b>Insulation resistance</b>	> 100 MOhm (DC 500 V)
<b>Typical internal resistance values</b>	
main circuit (EM1 – AM2.1/2.2); without device	5 mΩ
ELBUS/ 0V (1xEM, 4xAM, 1xTM); without device	60 mΩ; (5 mΩ for every additional AM)

## Technical data

### Typical mechanical values

#### Mounting values (circuit protectors)

Typical push-on force	approx. 180 N
Typical pull-out force	approx. 170 N

#### Number of push-on operations

Devices	50
Busbar	20

#### Mass

Module 18plus-EM03	approx. 76 g
Module 18plus-AM03	approx. 60 g
Module 18plus-TM03	approx. 47 g

#### Vibration (sinusoidal)

Test to IEC 60068-2-6, test Fc	3 g (57-500Hz), ± 0.38 mm (10-57 Hz)
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#### Shock

Test to IEC 60068-2-27, test Ea	15 g (18 ms)
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#### Humidity

Test to IEC 60068-2-78, test Cab	96 hrs in 95% RH
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## Available versions

18plus-EM03-00-PT01-01	18plus supply module, ELBus® version <b>ControlPlex®</b>
18plus-AM03-00-PT01-01	18plus connection module <b>ControlPlex®</b> for ESX60D circuit protector
18plus-TM03-00-PT01-01	18plus transfer module <b>ControlPlex</b> extension for CPC20 controller

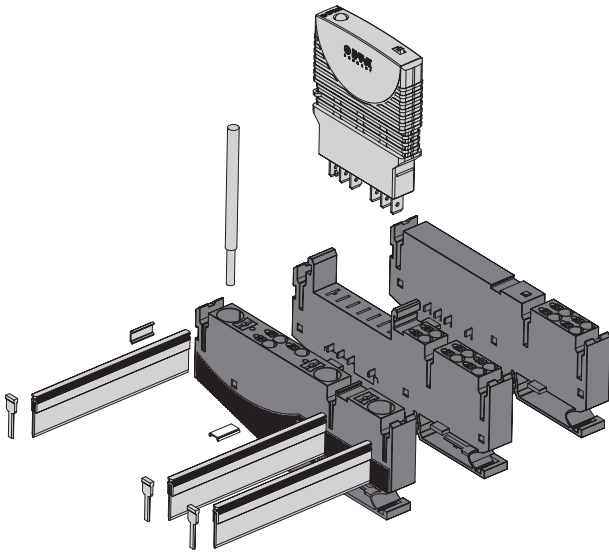
## Notes

- The 18plus is only intended for use with safety extra-low voltage (= 24 V DC).
- Connection to a higher or not reliably disconnected voltage can cause hazardous conditions or damages
- The CPC20 controller must exclusively be used.
- The technical data of the used circuit protectors have to be observed
- The entire power distribution system must only be installed by qualified personnel
- Only after expert installation must the device be supplied with power.
- After tripping of the circuit breaker/protector and reset, the cause of the failure (short circuit or overload) must be remedied.
- The national standards (e.g. for Germany DIN VDE 0100) have to be observed for installation and selection of feed and return cables.
- 0 V potential for load and control voltage is mandatory.
- For convenient adjustment and configuration by means of projecting software a master data file (GSDML file) will be made available for downloading on the E-T-A homepage
- Please observe the separate user manual for CPC20.

Module 18plus **ControlPlex®** consists of three different basic modules:

- supply module 18plus-EM03-...  
terminal 1 (LINE +), terminal 3 (0 V), terminal 4 (FE)  
ELBus terminal 15 ELB; 16 ADR ; 18 GND
- 18plus-AM03-... connection module  
terminal 2.1/2.2 (LINE +), terminal 3.1/3.2 (0 V), terminal 4.1/4.2 (FE)
- 18plus-TM03-... transfer module  
ELBus terminals 15 ELB; 16 ADR; 18 GND

## Mounting method



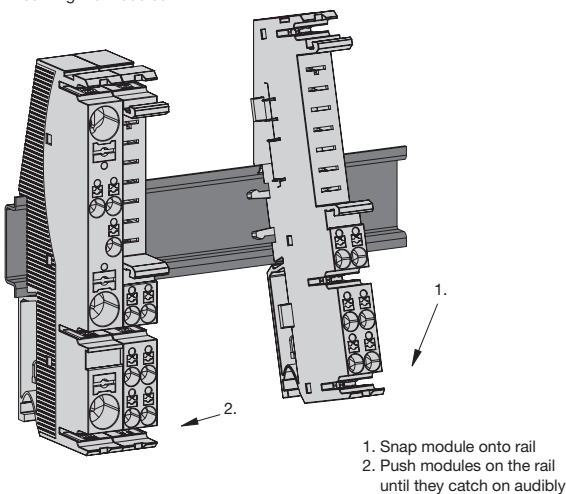
First the 18plus-EM supply module is snapped onto the symmetrical rail.

Snap on the 18plus-AM connection modules at a distance to the right and push them into the direction of the EM module until both latch on with a clicking sound.

Mechanical and electrical contact of the modules has then been established. Repeat as required corresponding to the number of connection modules. »SNAP ON – PUSH – CLICK«

The CPC20 module forms the end on the right side of the first system, the transfer module forms the end of the second system, which can be administrated by the CPC20. Assembly is the same as described above.

Mounting the modules:



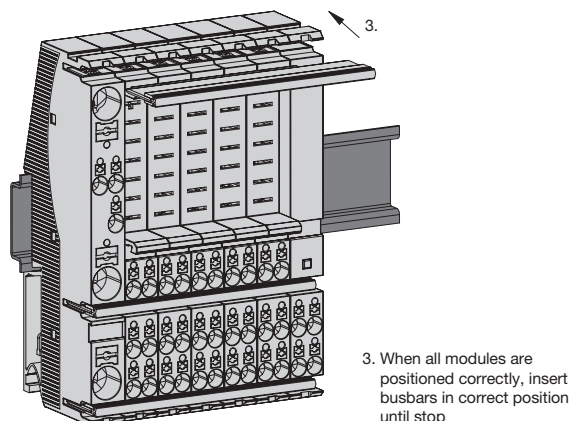
The supply module 18PLUS-EM with a width of 13.5mm holds 16 mm<sup>2</sup> supply terminals for LINE+ (DC24V), 0V and FE (functional earth).

An 80A power distribution of the supply onto the individual slots with a common supply is achieved by plugging in a busbar for PLUS, 0V and FE on the terminal side of the modules in the provided slots.

At the bottom of the connection modules there are two small moulded brush protection slides which can be broken out easily. These slides serve as an end cap over the plugged in busbars to ensure a mechanical protection against brush contact.

The connection module 18plus-AM ELBus has been designed to accommodate double channel ESX60D circuit protectors. Those will be plugged into the connection modules 18plus-AM. The AM modules can be mounted side by side, enabling bigger distribution systems with up to 16 slots. Each AM module is fitted with 4mm<sup>2</sup> push-in terminals for double connection of DC 24 V loads via L+, 0 V and FE, the max. load current is 20A per module.

Mounting the busbars:



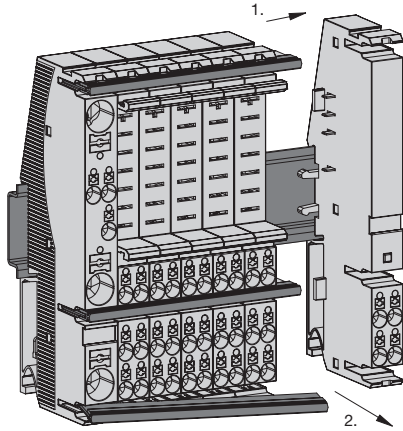
By mounting the individual connection modules 18PLUS-AM side-by-side, all internal wiring connections are established for the ELBus.

The 0 V reference potential of the connection module 18plus-EM for the ESX60D is already directly connected to the 0 V potential of the supply terminal 18plus-EM and is looped through to the next element over the blade terminals on the side. The side-by-side mounting (plug together) of the individual modules simultaneously establishes all internal wirings for the 0 V potential and for the **ELBus**®.

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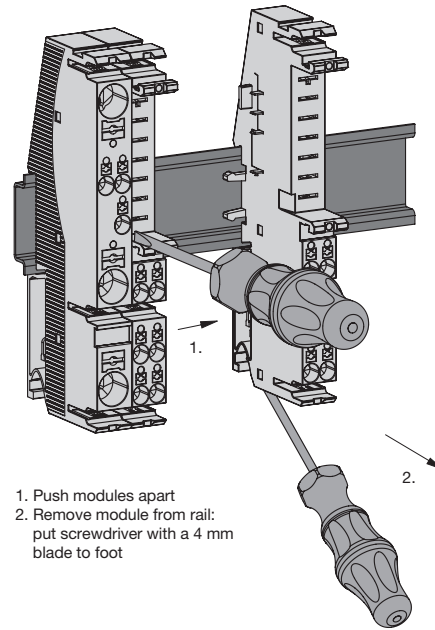
**Disassembly**

Removing the busbars:



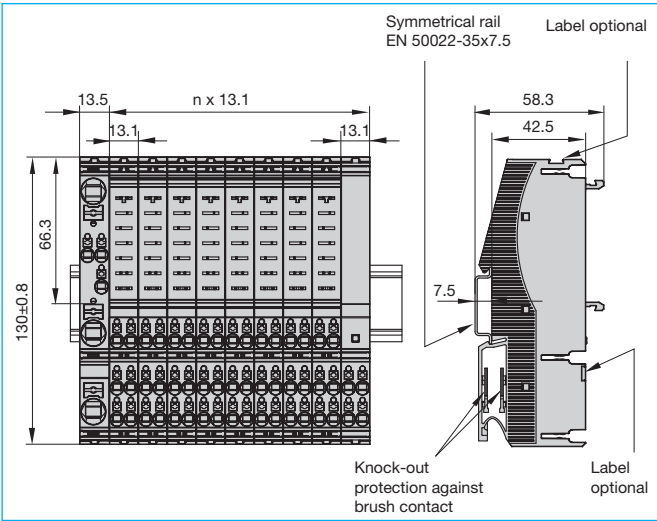
1. Push away signalling module to remove busbar
2. Pull busbar out of the groove

Removing the modules:

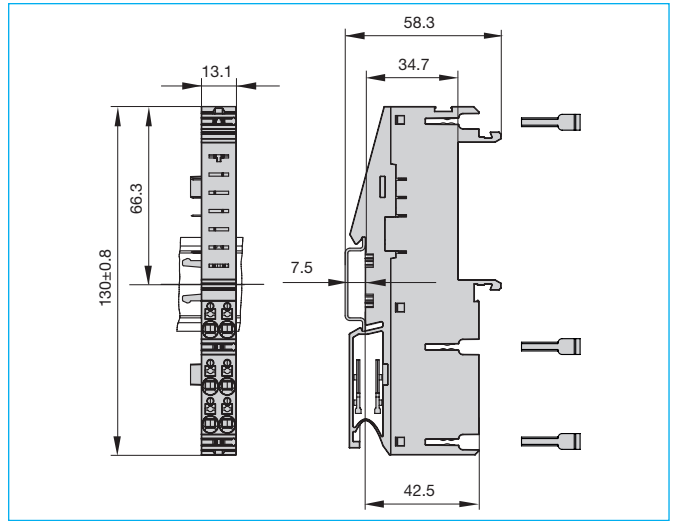


1. Push modules apart
2. Remove module from rail: put screwdriver with a 4 mm blade to foot

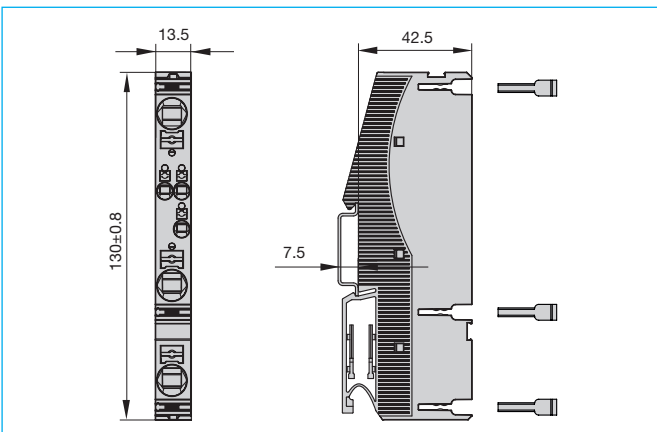
**Dimensions of socket system:**



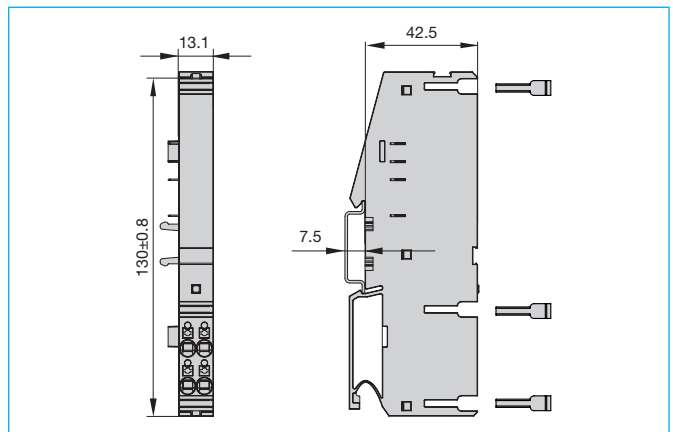
**Dimensions AM**



**Dimensions EM**

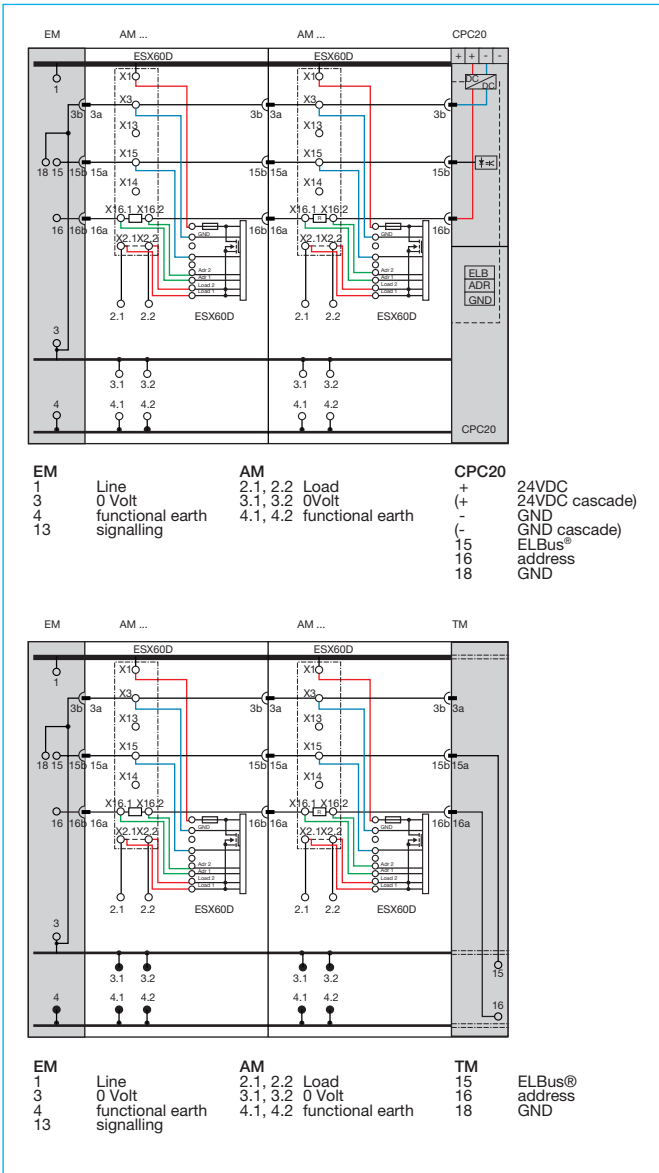


**Dimensions TM**

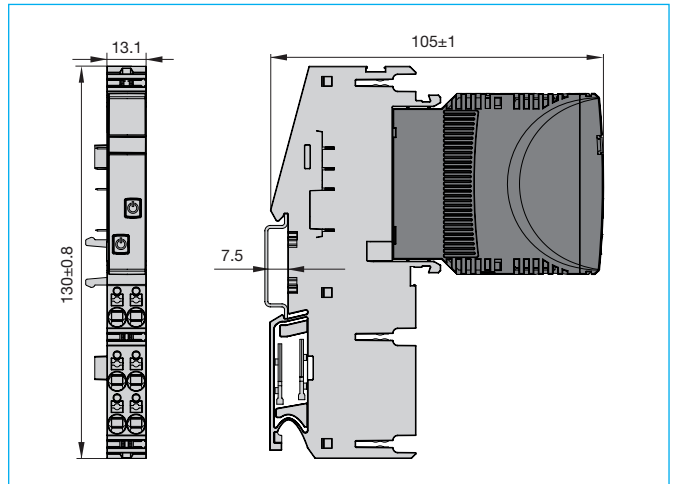




**Schematic diagram, with ESX60D circuit protector**



**Dimensions, fitted with ESX60D**



**Pin assignment, fitted with ESX60D**

ESX60D	Module 18plus-ControlPlex®
1 LINE (+)	1
3 GND	3
15 ELB	15
16.1, 16.2 ADR	16.1, 16.2
2.1, 2.2 LOAD (+)	2.1, 2.2

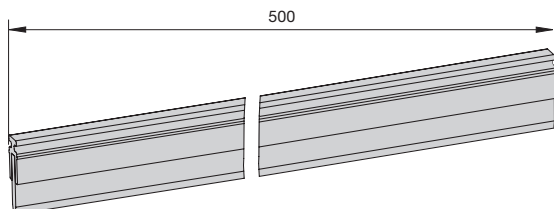
Accessories

**Busbar**

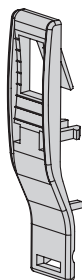
**X 222 611 02** busbar for LINE, 0 V, FE, grey insulation, 500 mm

**FTG-Busbar**

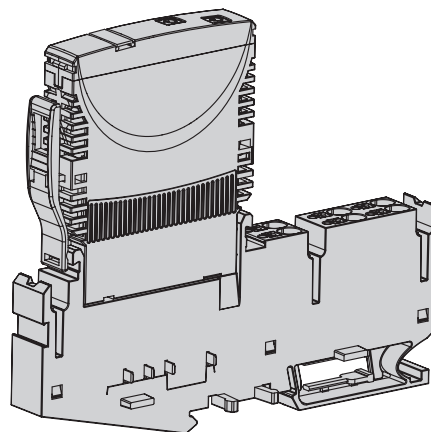
**X 223 571 01** busbar for LINE, 0 V, FE, grey insulation, 500 mm



**Retaining clip Y 311 978 01**  
Retaining clip for ESX60D



**Installation example with ESX60D with optional retaining clip**



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