INSTALLATION INSTRUCTIONS - ORIGINAL INSTRUCTIONS

AC500 product family

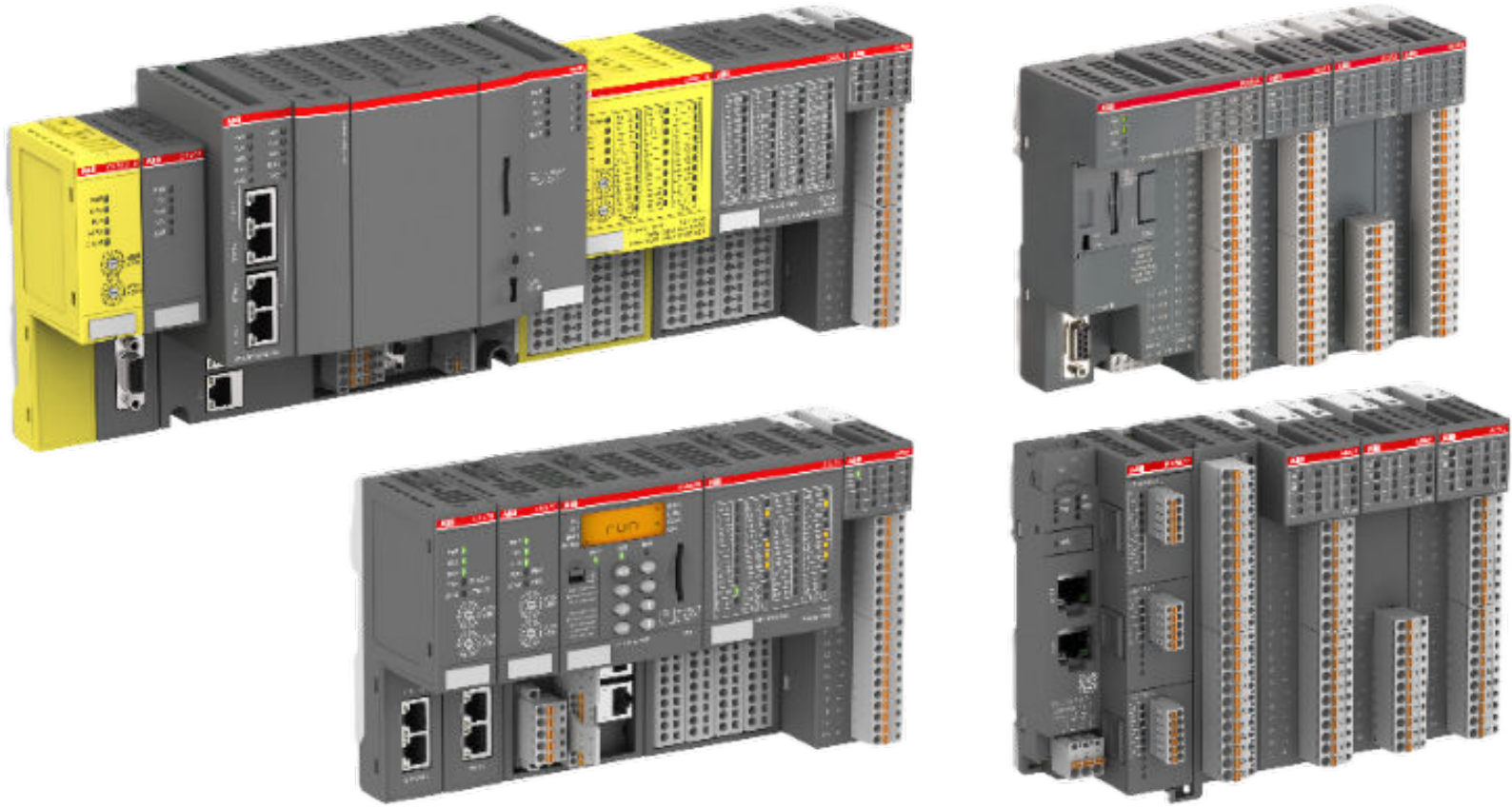


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1 Documentation guide



Where to find the latest information about:

- PLC system
  - Overall manual for PLC Automation
    Chapter 1 “Documentation guide” on page 24
    Online help
    PDF
  - System manual
    Online help
    PDF
  - Getting started: First steps with the platform and creation of your first program
    Online help
    PDF
    Starter kit (PDF)
  - Safety user manual for safety PLCs
    Online help
    PDF
- Devices
  - Data sheets
    PDF
  - Installation instructions
    PDF
  - PLC hardware descriptions
    Online help
    PDF
  - Safety user manual for safety PLCs
    Online help
    PDF
  - Control panels
    PDF
- Software and programming
  - Configuration and programming
    Online help
    PDF
  - Programming examples available for download
    PDF
  - Programming examples available in the engineering suite: Open Automation Builder menu *“Help ➔ Project examples”*
  - Application descriptions for specific features and use cases
    PDF
  - Release notes for the latest version of the engineering suite Automation Builder
    PDF

2 Regulations

Planning and installation of the electrical system

Industrial environment

The products have been designed for use in an industrial environment in compliance with the 2014/30/EU directive.

The planning and installation of the electrical system must be carried out in compliance with the applicable regulations and standards. Hazards due to malfunctions must be prevented by taking appropriate measures.

The suitability of the products for the respective application is proven by declarations of conformity and certificates.

The PLC Automation catalog contains an
overview of the available declarations of conformity and certificates.

Distributer contacts

For all PLC devices the ABB AG is manufacturer or importer according to EU regulations.

The rating plate on the PLC devices shows the manufactoring location and if necessary the importer contact details.

ABB AG Eppelheimerstraße 82 69123 Heidelberg Germany	UK importer address: **ABB Ltd** Daresbury Park WA4 4BT Cheshire - United Kingdom

Qualified personnel

Both the AC500 control system and other components in the vicinity are operated with dangerous touch voltages. Touching live components can lead to serious health implications or even death.

To avoid such risks and the occurrence of property damage, persons involved in the installation, commissioning and maintenance must have relevant knowledge about the following:

- Automation technology
- Handling of hazardous voltages
- Application of relevant standards and regulations (e.g. EN 60204-1), accident prevention regulations and regulations on special environmental conditions (e.g., hazardous areas due to explosive substances, heavy soiling or corrosive influences).

Applications in UL hazardous locations

Suitable for use in Class 1, Division 2, Groups A, B, C and D-T4 hazardous locations, or non-hazardous locations only.

Substitution of any component may impair suitability for Class 1, Division 2.

WARNING!

Explosion hazard

Exposure to some chemicals may degrade the sealing properties of material used in the relays.

WARNING!

Removal/Insertion under power

Removal or insertion under power is permissible only if all conditions for hot swapping are fullfilled.

“Conditions for hot swap” on page 30

The devices are not designed for removal or insertion under power when the conditions for hot swap do not apply. Because of unforeseeable consequences, it is not allowed to plug in or unplug devices with the power being ON.

Make sure that all voltage sources (supply and process voltage) are switched off before doing any of the following actions:

– Connect or disconnect any signal or terminal block.
– Remove, mount or replace a module.

Disconnecting any powered devices while they are energized in a hazardous location could result in an electric arc, which could create an ignition source resulting in fire or explosion.

Prior to proceeding, make sure that power is been disconnected and that the area has been thoroughly checked to ensure that flammable materials or ignitable concentrations are not present.

The devices must not be opened when in operation. The same applies to the network interfaces.

3 Safety instructions

Industrial environment

The products have been designed for use in an industrial environment in compliance with the 2014/30/EU directive.

Relevant standards and regulations, accident prevention regulations and regulations on special environmental conditions must be observed (e.g. hazardous areas due to explosive substances, heavy soiling or corrosive influences).

The devices must be handled and operated within the specified technical data and system data.

The devices contain no serviceable parts and must not be opened.

Removable covers must be closed during operation unless otherwise specified.

If the equipment is used in a manner not specified by ABB, the protection provided by the equipment may be compromised. Any liability for the consequences of incorrect use or unauthorized repairs is rejected.

Qualified personnel

Both the AC500 control system and other components in the vicinity are operated with dangerous touch voltages. Touching live components can lead to serious health implications or even death.

To avoid such risks and the occurrence of property damage, persons involved in the installation, commissioning and maintenance must have relevant knowledge about the following:

- Automation technology
- Handling of hazardous voltages
- Application of relevant standards and regulations (e.g. EN 60204-1), accident prevention regulations and regulations on special environmental conditions (e.g., hazardous areas due to explosive substances, heavy soiling or corrosive influences).

Functional safety

The AC500-S safety user manual must be read and understood before using the safety configuration and programming tools of Automation Builder/PS501 Control Builder Plus. Only qualified personnel are permitted to work with AC500-S safety PLCs.

AC500-S safety user manual

General information

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variants and requirements associated with any particular installation, ABB cannot assume responsibility or liability for actual use based on the examples and diagrams.

The PLC was developed according to the relevant standards. Any module-specific measures are described in the individual descriptions of the modules.

PLC-specific safety notices

The product family AC500 control system is designed according to the EN 61131-2 and IEC 61131-2 standards. Any data that differs from IEC 61131-2, is due to the higher requirements of Maritime Services. Other differences are described in the technical data description of the devices.

NOTICE!

Avoidance of electrostatic charging

PLC devices and equipment are sensitive to electrostatic discharge, which can cause internal damage and affect normal operation.

Observe the following rules when handling the system:

- Touch a grounded object to discharge potential static.
- Wear an approved grounding wrist strap.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the equipment.
- If available, use a static-safe workstation.
- When not in use, store the equipment in appropriate static-safe packaging.

NOTICE!

Use of suitable enclosure

The devices must be mounted in a control cabinet that ensures compliance with the specified environmental conditions.

Cleaning instructions

Do not use cleaning agent for cleaning the device.

Use a damp cloth instead.

Connection plans and a user program must be created so that no dangerous situations can occur during normal operation or failure.

The application must be tested to ensure that no dangerous situations can occur during operation.

Do not operate devices outside of the specified, technical data!

Trouble-free functioning cannot be ensured outside of the specified data.

NOTICE!

PLC damage due to missing grounding

- Make sure to ground the devices.
- The grounding (switch cabinet grounding) is supplied both by the mains connection (or 24 V supply voltage) and via the DIN rail. The DIN rail must be connected to ground before power is supplied to the device. The grounding may be removed only if it is certain that no more power is being supplied to the control system.
- In case of screw mounting, use metal screws for grounding.

CAUTION!

Do not obstruct the ventilation for cooling!

The ventilation slots on the upper and lower sides of the devices must not be covered.



CAUTION!

Run signal and power wiring separately!

Signal and supply lines (power cables) must be laid out so that no malfunctions due to capacitive and inductive interference can occur (EMC).



WARNING!

Warning sign on the module!

This indicates that dangerous voltages may be present or that surfaces may have dangerous temperatures.



WARNING!

Splaying of strands can cause hazards!

Avoid splayed strands when wiring terminals with stranded conductors.

– Ferrules can be used to prevent splaying.



WARNING!

Removal/Insertion under power

Removal or insertion under power is permissible only if all conditions for hot swapping are fullfilled.

↳ *“Conditions for hot swap” on page 30*

The devices are not designed for removal or insertion under power when the conditions for hot swap do not apply. Because of unforeseeable consequences, it is not allowed to plug in or unplug devices with the power being ON.

Make sure that all voltage sources (supply and process voltage) are switched off before doing any of the following actions:

– Connect or disconnect any signal or terminal block.
– Remove, mount or replace a module.

Disconnecting any powered devices while they are energized in a hazardous location could result in an electric arc, which could create an ignition source resulting in fire or explosion.

Prior to proceeding, make sure that power is been disconnected and that the area has been thoroughly checked to ensure that flammable materials or ignitable concentrations are not present.

The devices must not be opened when in operation. The same applies to the network interfaces.

NOTICE!

Except when using hot swap terminal units, the I/O bus is not designed for pulling and plugging modules during operation.

If a module is pulled or plugged on a terminal unit that is **not** hot swap capable while the bus is running, the following consequences are possible.

– Reset of the station or of the processor module.
– System lockup.
– Damage of the module.

Conditions for hot swap

NOTICE!

Risk of device damage!

– I/O modules with a device index **above** F0 can be hot-swapped. When I/O modules **below** F0 are inserted or removed from the terminal unit in a powered system the I/O modules can be damaged.
  Before hot swapping a device, check the device index and ensure that the modules meet the requirements. *Table 1 “Allowed device indexes for I/O modules for hot swapping” on page 32*
– Terminal units that support hot swapping of I/O modules have the appendix TU5xx**-H**.
– Hot swap is not supported by AC500-eCo CPU!

The following I/O bus masters support hot swapping of attached I/O modules:

– Communication interface modules CI5xx as of index F0.
– Processor modules PM56xx-2ETH with firmware version as of V3.2.0.

NOTICE!

Risk of damage to I/O modules!

Hot swapping is only allowed for I/O modules.

Processor modules and communication interface modules must not be removed or inserted during operation.

Conditions for hot swapping

– *Digital outputs are not under load.*
– *Input/output voltages above safety extra low voltage/ protective extra low voltages (SELV/PELV) are switched off.*
– *Modules are completely plugged on the terminal unit with both snap fit engaged before switching on loads or input/output voltage.*

Information on batteries

CAUTION!

Use only ABB approved lithium battery modules!

At the end of the battery’s lifetime, always replace it only with a genuine battery module.



CAUTION!

Risk of explosion!

Do not open, re-charge or disassemble primary lithium battery. Attempting to charge primary lithium battery will lead to overheating and can cause explosions.

Protect them from heat and fire and store them in a dry place.

Never short-circuit or operate primary lithium battery with the polarities reversed. The primary lithium battery are likely to overheat and explode. Avoid unintentional short circuiting do not store primary lithium batteries in metal containers and do not place them on metallic surfaces. Escaping lithium is a health hazard.



Environment considerations

Recycle exhausted batteries. Dispose of batteries in an environmentally conscious manner in accordance with regulations issued by the local authorities.

4 PLC System

4.1 Hot swap PLC devices

NOTICE!

Risk of device damage!

– I/O modules with a device index **above** F0 can be hot-swapped. When I/O modules **below** F0 are inserted or removed from the terminal unit in a powered system the I/O modules can be damaged.

  Before hot swapping a device, check the device index and ensure that the modules meet the requirements. *Table 1 “Allowed device indexes for I/O modules for hot swapping” on page 32*

– Terminal units that support hot swapping of I/O modules have the appendix TU5xx**-H**.

– Hot swap is not supported by AC500-eCo CPU!

The following I/O bus masters support hot swapping of attached I/O modules:

– Communication interface modules CI5xx as of index F0.

– Processor modules PM56xx-2ETH with firmware version as of V3.2.0.

Table 1: Allowed device indexes for I/O modules for hot swapping

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
AC522(-XC)	F0	F0
AI523 (-XC)	F0	D2
AI531	F0	D4
AI531-XC	F0	D2
AI561	hot swap is not supported	B2
AI562	hot swap is not supported	B2
AI563	hot swap is not supported	B3
AI564	hot swap is not supported	A0
AI565	hot swap is not supported	A0
AI568	hot swap is not supported	A0
AI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
AO522 (-XC)	F0	F0
AO523 (-XC)	F0	D2
AO561	hot swap is not supported	B2
AO562	hot swap is not supported	A0
AO568	hot swap is not supported	A0
AX521 (-XC)	F0	D2
AX522 (-XC)	F0	D2
AX561	hot swap is not supported	B2
CD522 (-XC)	hot swap is not supported	D1

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
DA501 (-XC)	F0	D2
DA502 (-XC)	F0	F0
DC522 (-XC)	F0	D2
DC523 (-XC)	F0	D2
DC532 (-XC)	F0	D2
DC562	hot swap is not supported	A2
DI524 (-XC)	F0	D2
DI561	hot swap is not supported	B2
DI562	hot swap is not supported	B2
DI571	hot swap is not supported	B2
DI572	hot swap is not supported	A1
DI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
DO524 (-XC)	F0	A3
DO526	F0	A2
DO526-XC	F0	A0
DO561	hot swap is not supported	B2
DO562	hot swap is not supported	A2
DO571	hot swap is not supported	B3
DO572	hot swap is not supported	B2
DO573	hot swap is not supported	A1
DX522 (-XC)	F0	D2
DX531	F0	D2
DX561	hot swap is not supported	B2
DX571	hot swap is not supported	B3
DX581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
FM562	F0	A1
FM565	hot swap is not supported	A0
FM566	hot swap is not supported	A0

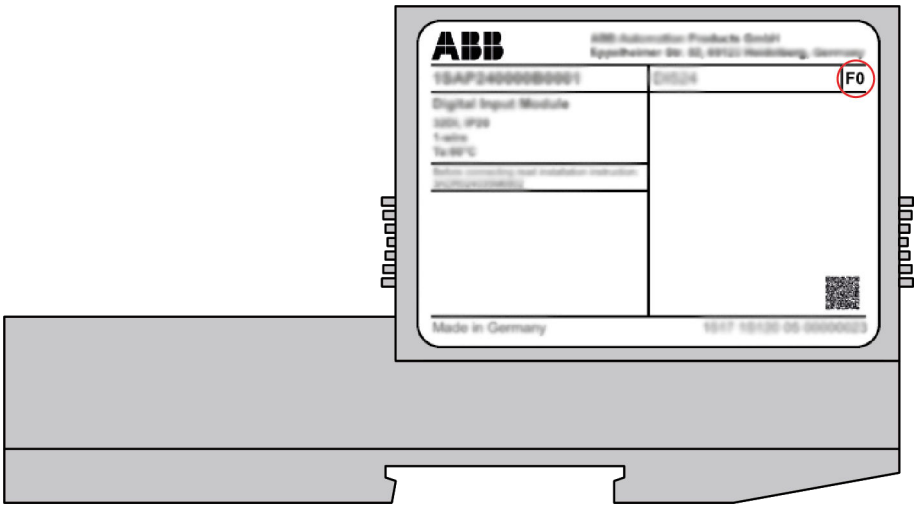


Fig. 1: The index of the module is in the right corner of the label.

WARNING!

Risk of explosion or fire in hazardous environments during hot swapping!

Hot swap must not be performed in flammable environments to avoid life-threatening injury and property damage resulting from fire or explosion.

WARNING!

Electric shock due to negligent behavior during hot swapping!

To avoid electric shock, do the following.

- Make sure the following conditions apply:
  - Digital outputs are not under load.
  - Input/output voltages above safety extra low voltage/ protective extra low voltage (SELV/PELV) are switched off.
  - Modules are fully interlocked with the terminal unit with both snap-fits engaged before switching on loads or input/output voltage.
- Never touch exposed contacts (dangerous voltages).
- Stay away from electrical contacts to avoid arc discharge.
- Do not operate a mechanical installation improperly.

NOTICE!

Risk of damage to I/O modules!

Hot swapping is only allowed for I/O modules.

Processor modules and communication interface modules must not be removed or inserted during operation.

4.2 Connection of wires at the spring terminals

Connection

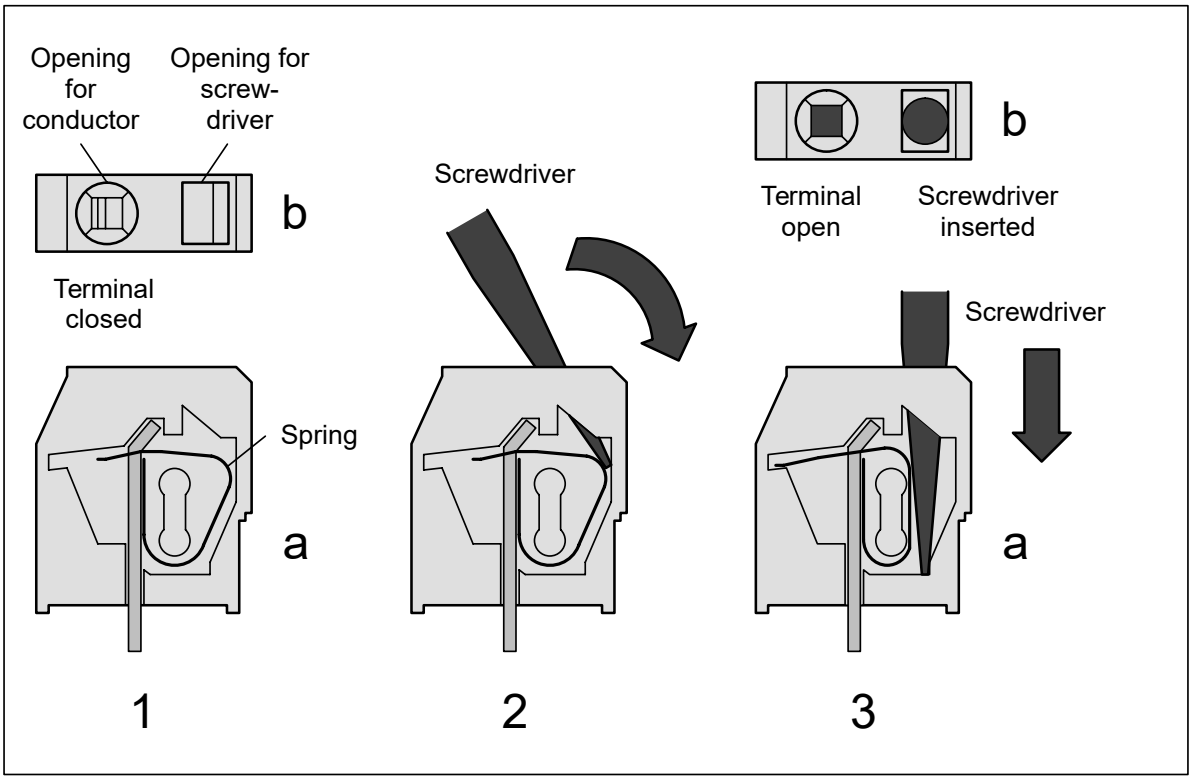


Fig. 2: Connect the wire to the spring terminal (steps 1 ... 3)

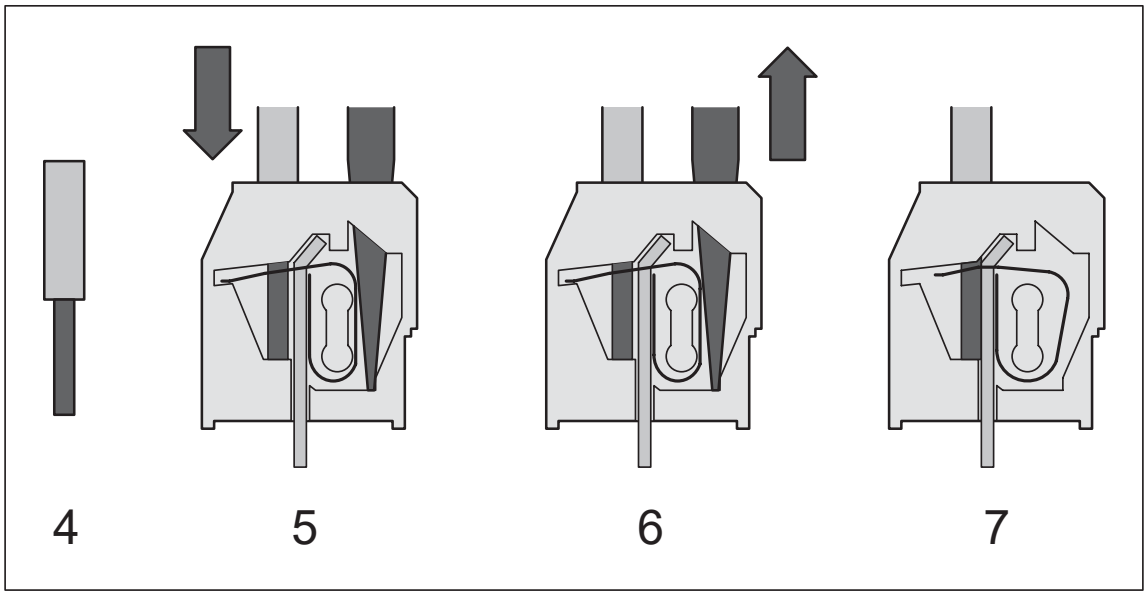


Fig. 3: Connect the wire to the spring terminal (steps 4 ... 7)

1. Side view (open terminal drawn for illustration)
2. The top view shows the openings for wire and screwdriver
3. Insert screwdriver (2.5 x 0.4 to 3.5 x 0.5 mm) at an angle, screwdriver must be at least 15 mm free of insulation at the tip
4. While erecting the screwdriver, insert it until the stop (requires a little strength)
5. Screwdriver inserted - terminal open
6. Strip the wire for 7 mm (and put on wire-end ferrule)

7. Insert wire into the open terminal
8. Done

Disconnection

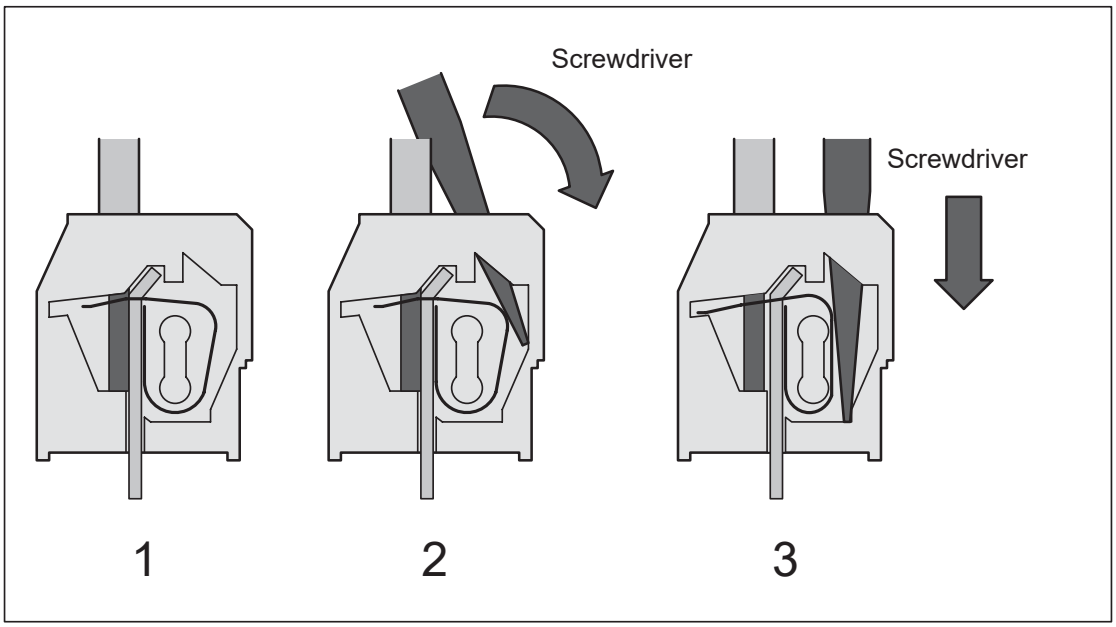


Fig. 4: Disconnect wire from the spring terminal (steps 1 ... 3)

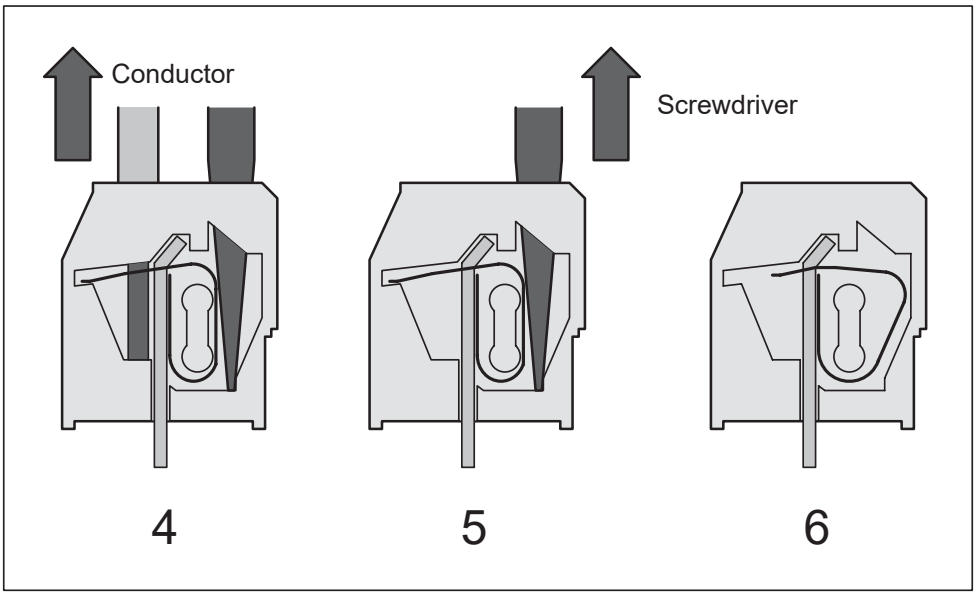


Fig. 5: Disconnect wire from the spring terminal (steps 4 ... 6)

1. Terminal with wire connected
2. Insert screwdriver (2.5 x 0.4 ... 3.5 x 0.5 mm) at an angle, screwdriver must be at least 15 mm free of insulation at the tip
3. While erecting the screwdriver, insert it until the stop (requires a little strength) - terminal is now open
4. Remove wire from the open terminal
5. Done

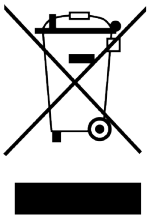
4.3 Cleaning

Cleaning instructions

Do not use cleaning agent for cleaning the device.

Use a damp cloth instead.

4.4 Recycling



Disposal and recycling information

This symbol on the product (and on its packaging) is in accordance with the European Union's Waste Electrical and Electronic Equipment (WEEE) Directive.

The symbol indicates that this product must be recycled/disposed of separately from other household waste.

It is the end user's responsibility to dispose of this product by taking it to a designated WEEE collection facility for the proper collection and recycling of the waste equipment.

The separate collection and recycling of waste equipment will help to conserve natural resources and protect human health and the environment.

For more information about recycling, please contact your local environmental office, an electrical/electronic waste disposal company or the store where you purchased the product.

4.5 Certification

MSIP-REI-Abb-AC500

en Devices with KCC sign on product sticker and packaging

ko 제품 스티커 및 포장에 **KCC** 표시가 된 기기

en **Note**
These devices correspond to:

KN61000-6-2 "Immunity for industrial environments",
KN61000-6-4 "Emission standard for industrial environments"

ko 참고
이러한 기기는

KN61000-6-2 "산업 환경에 대한 내성",
KN61000-6-4 "산업 환경 누출 기준"에 적합함

MSIP-REI-Abb-AC500-eCoS500e

en Devices with KC sign on product sticker and packaging

ko 제품 스티커 및 포장에 **KC** 표시가 된 기기

en **Note**
These devices correspond to:

KN61000-6-2 "Immunity for industrial environments",
KN61000-6-4 "Emission standard for industrial environments"

ko 참고
이러한 기기는

KN61000-6-2 "산업 환경에 대한 내성",
KN61000-6-4 "산업 환경 누출 기준"에 적합함

5 AC522(-XC)

- AC522
- AC522-XC





CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

NOTICE!

Hot swap

Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

↳ *Chapter 4 “PLC System” on page 32*

NOTICE!

Risk of device damage!

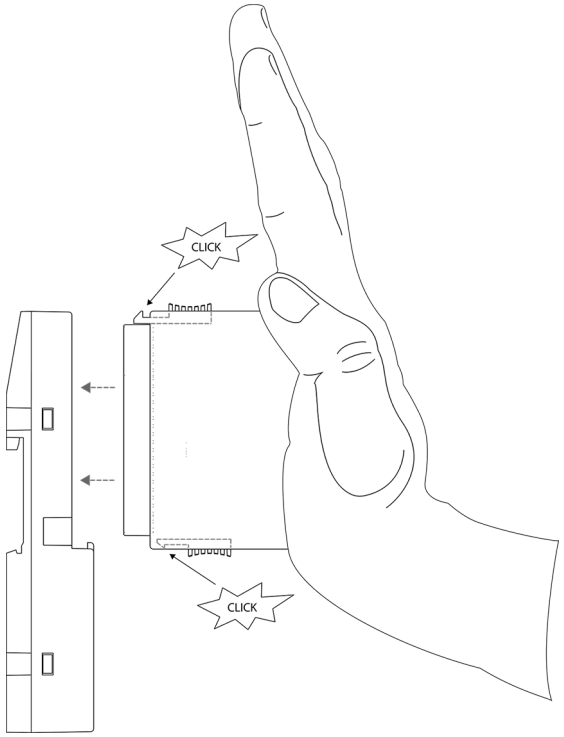
- I/O modules with a device index **above** F0 can be hot-swapped. When I/O modules **below** F0 are inserted or removed from the terminal unit in a powered system the I/O modules can be damaged.

  Before hot swapping a device, check the device index and ensure that the modules meet the requirements. ↳ *Table 1 “Allowed device indexes for I/O modules for hot swapping” on page 32*
- Terminal units that support hot swapping of I/O modules have the appendix TU5xx**-H**.
- Hot swap is not supported by AC500-eCo CPU!

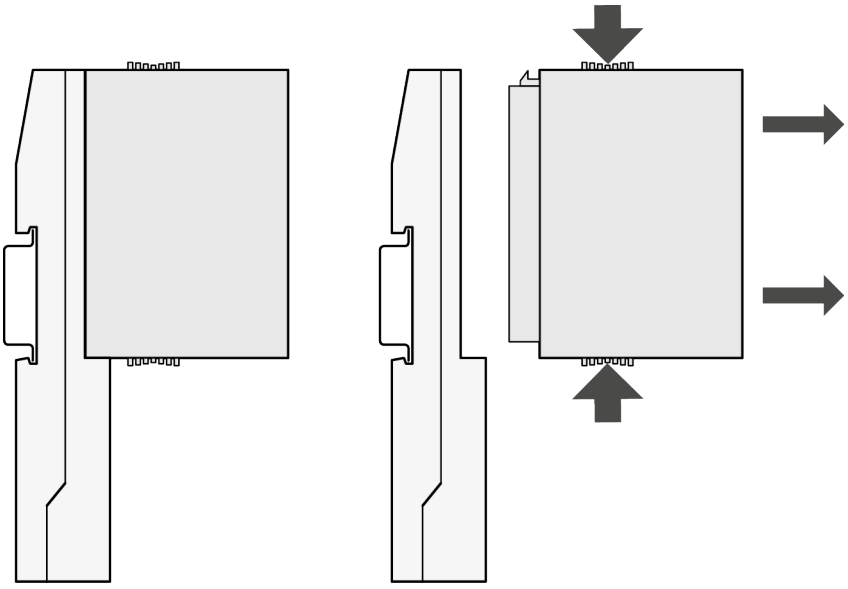
The following I/O bus masters support hot swapping of attached I/O modules:

- Communication interface modules CI5xx as of index F0.
- Processor modules PM56xx-2ETH with firmware version as of V3.2.0.

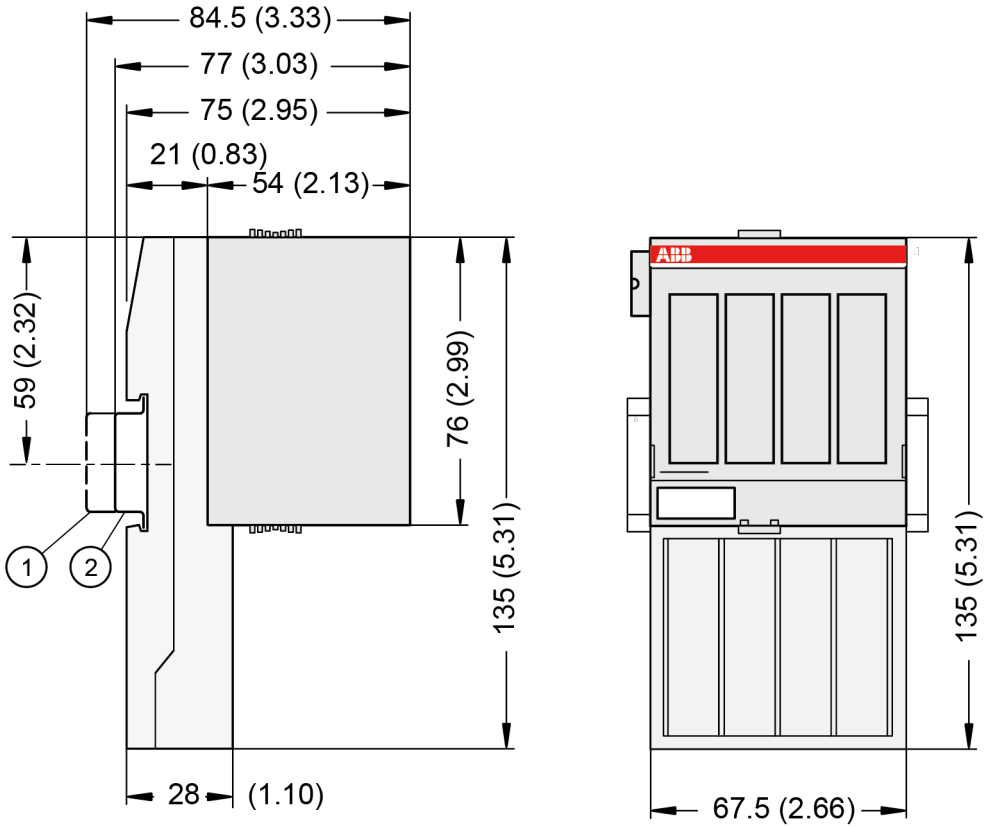
5.1 Assembly



5.2 Disassembly



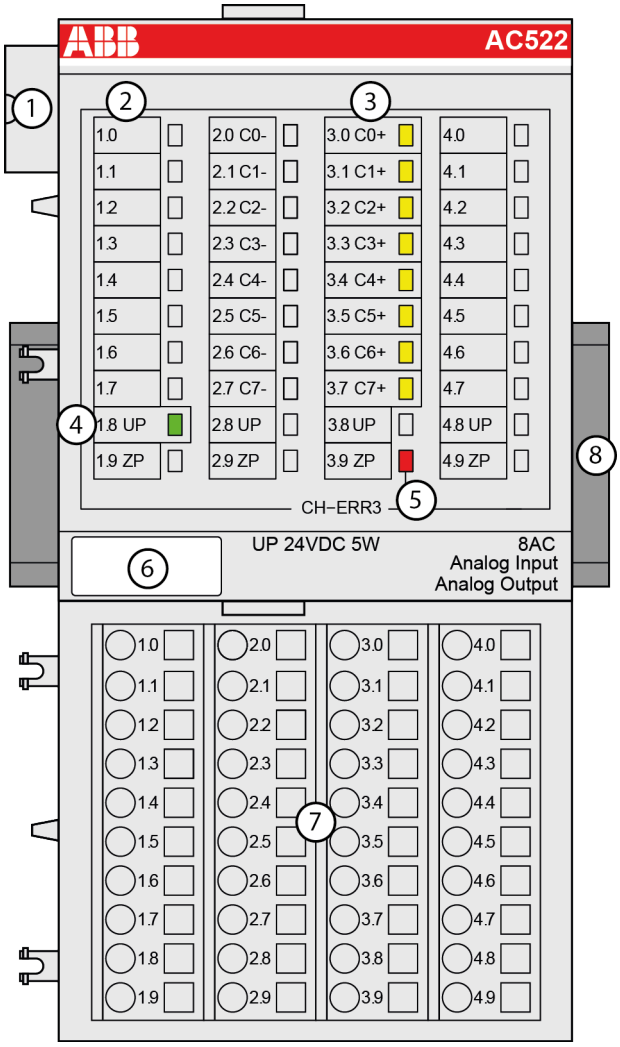
5.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

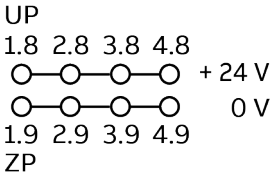
5.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states at the analog inputs/outputs (C0 ... C7)
4 1 green LED to display the state of the process supply voltage UP
5 1 red LED to display errors
6 Label
7 Terminal unit
8 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

5.4.2 Inputs/Outputs

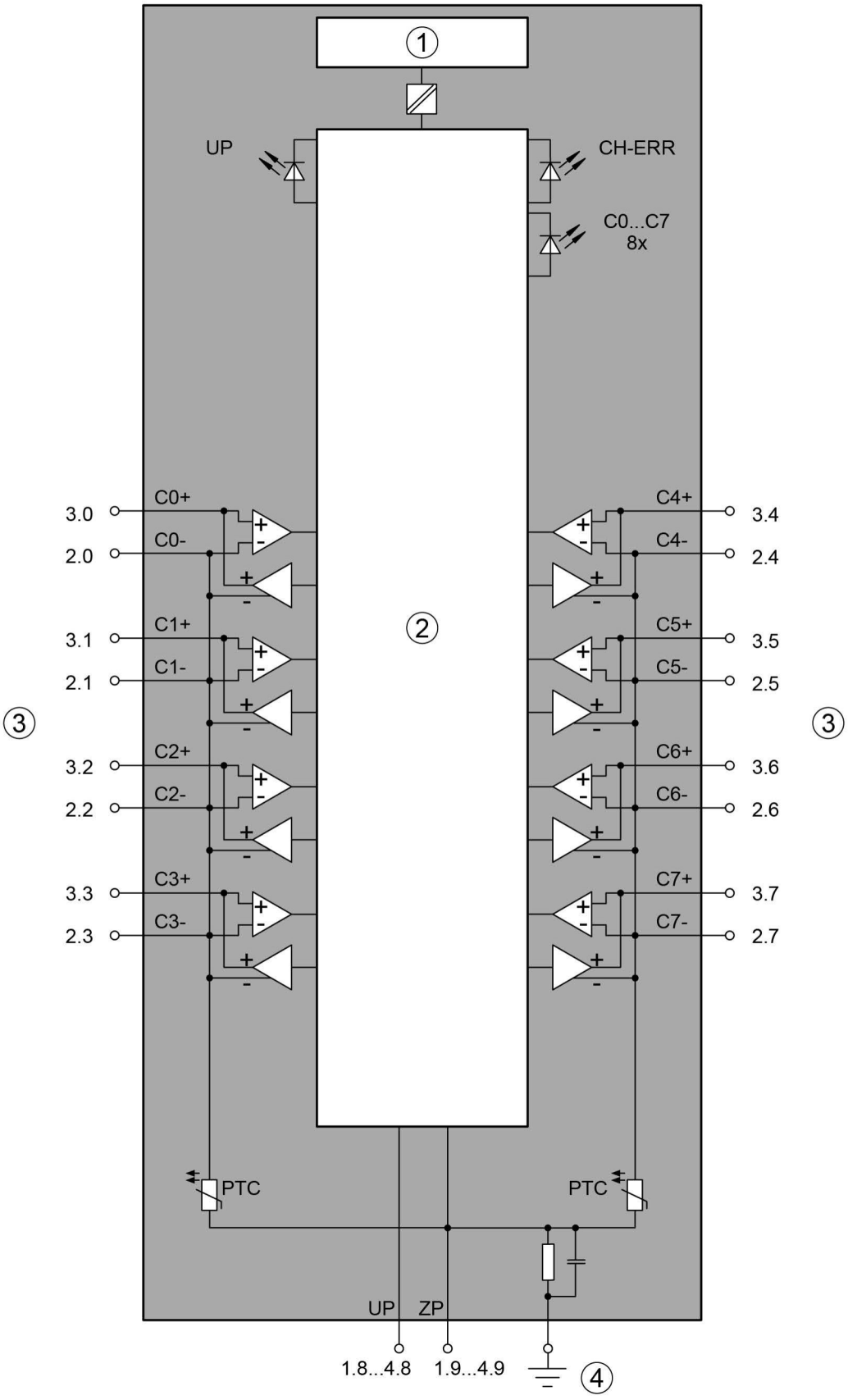
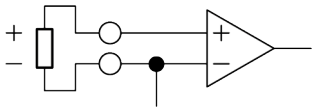


Fig. 6: Connection of the I/O module

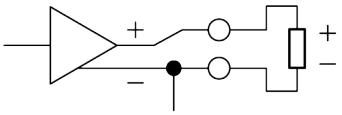
1 I/O bus interface
2 Logic
3 Analog inputs/outputs
4 Functional earth connection

Examples



C0 ... C7
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 7: Example of connection input



C0 ... C3	C4 ... C7
± 10 V	± 10 V
0 mA ... +20 mA	–
+4 mA ... +20 mA	–

Fig. 8: Example of connection output

6 AI523(-XC)

- AI523
- AI523-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

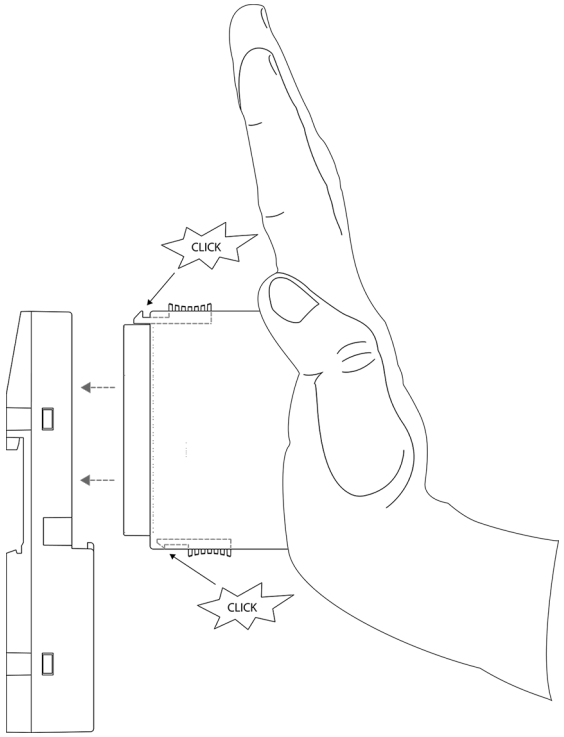
NOTICE!

Hot swap

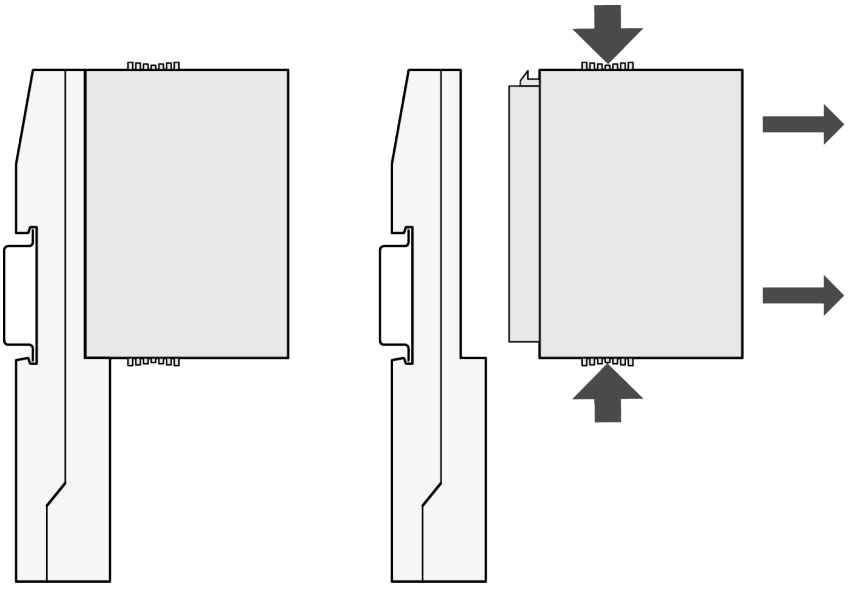
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

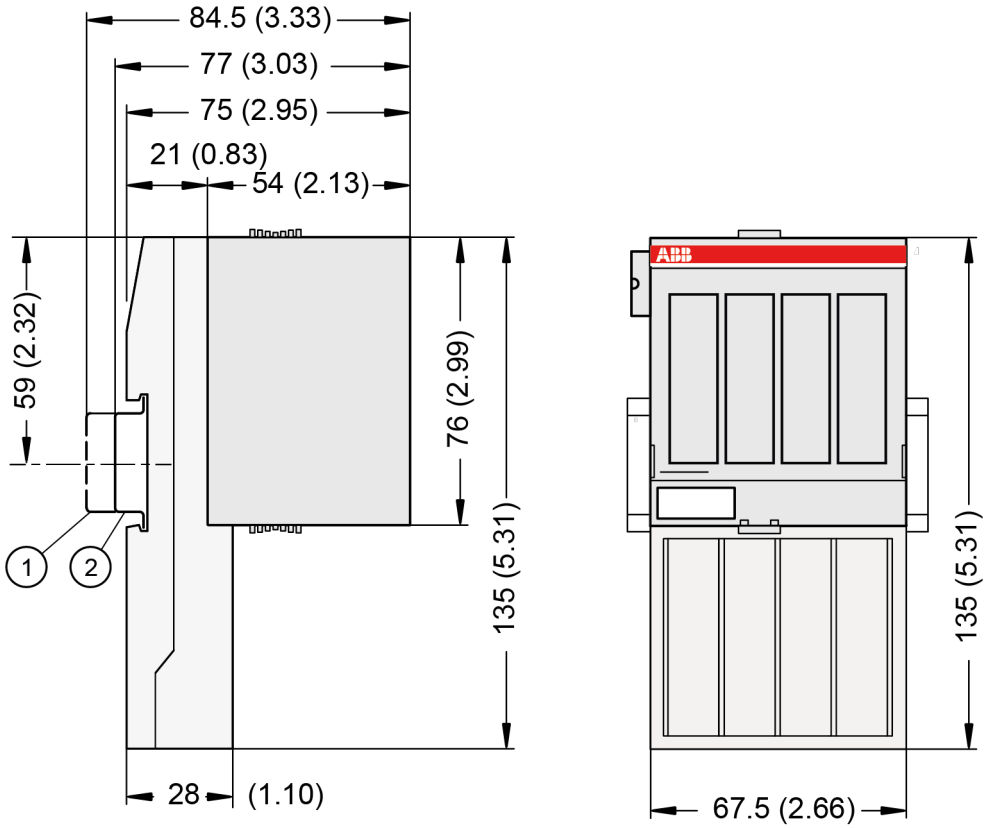
6.1 Assembly



6.2 Disassembly



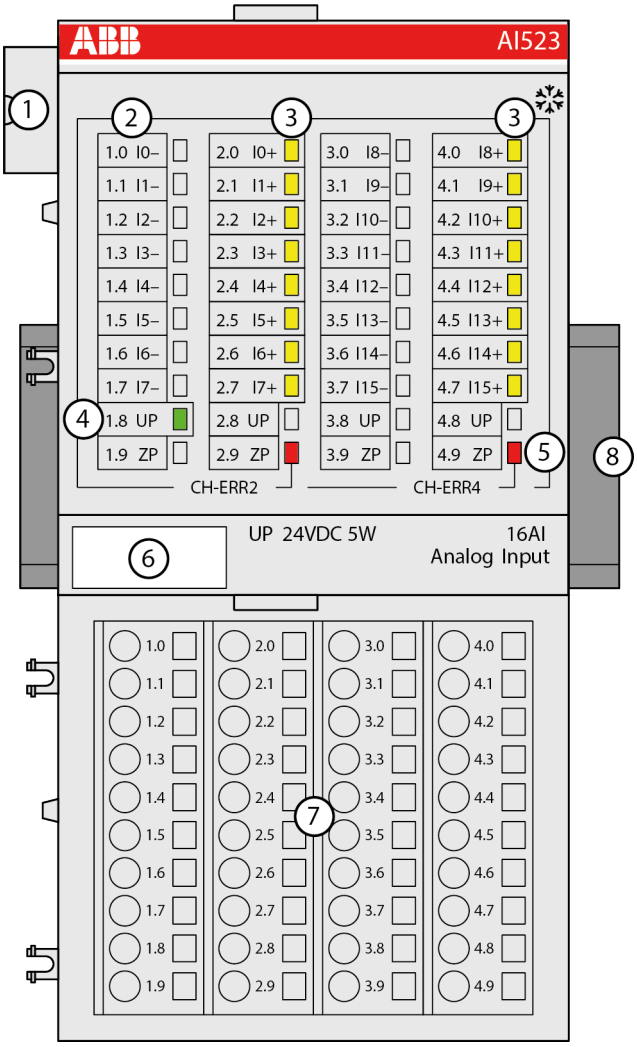
6.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

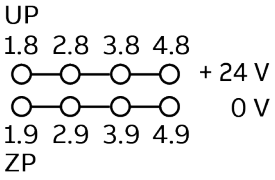
6.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 16 yellow LEDs to display the signal states at the analog inputs (I0 ... I15)
4 1 green LED to display the state of the process supply voltage UP
5 2 red LEDs to display errors
6 Label
7 Terminal unit
8 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

6.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

6.4.2 Inputs

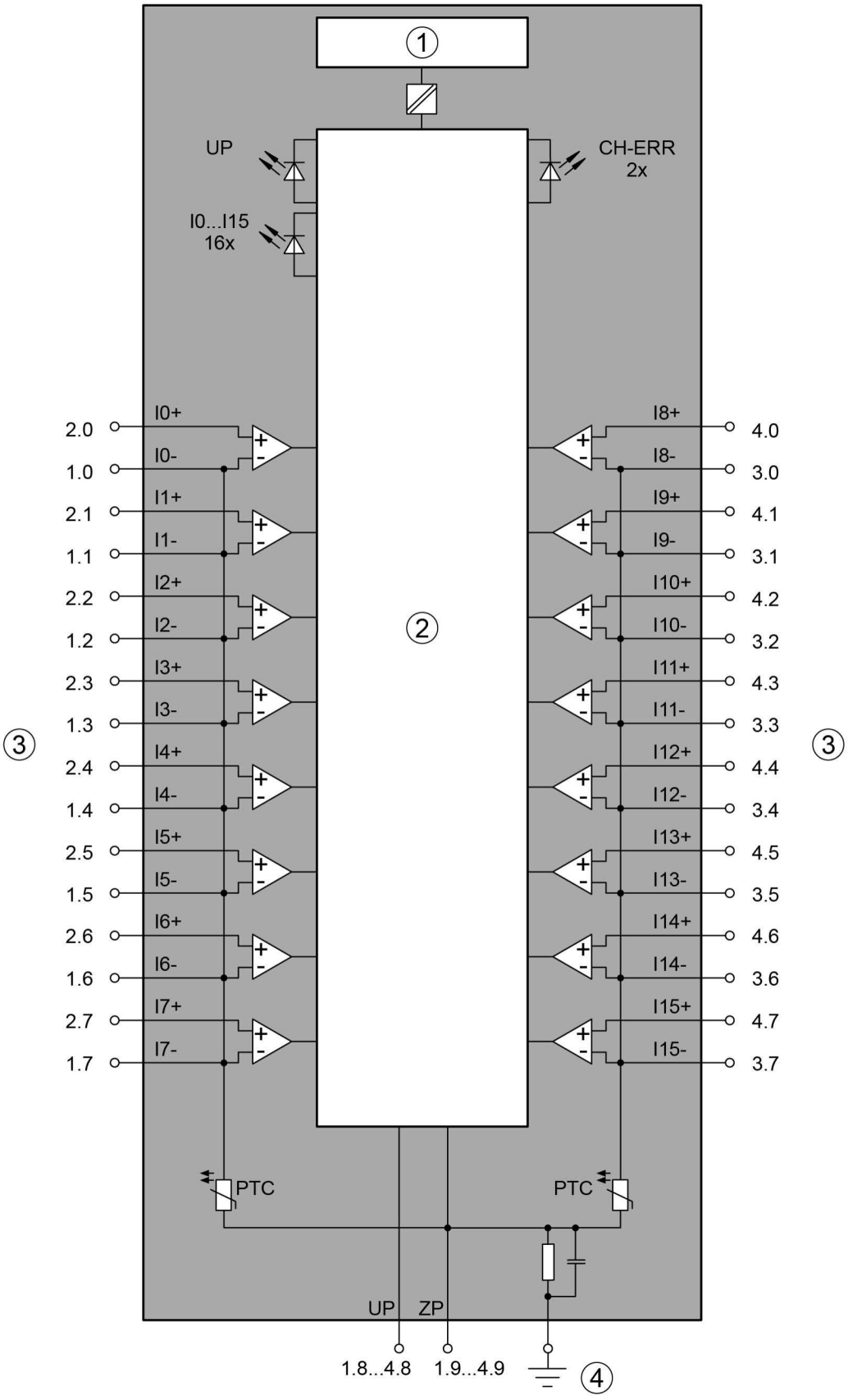
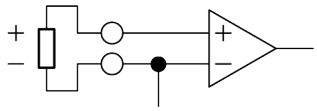


Fig. 9: 16 analog inputs in two groups, individually configurable

1 I/O bus interface
2 Logic
3 Analog inputs
4 Functional earth connection

Example



I0 ... I15
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 10: Example of connection input

7 AI531(-XC)

- AI531
- AI531-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

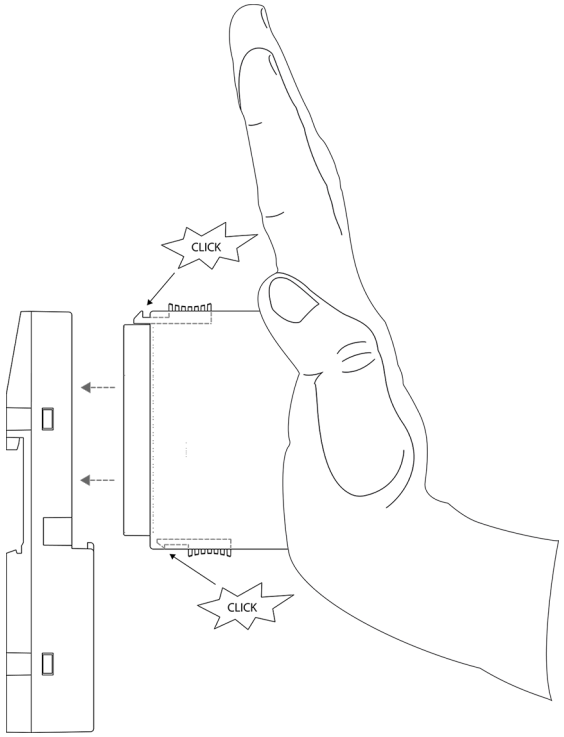
NOTICE!

Hot swap

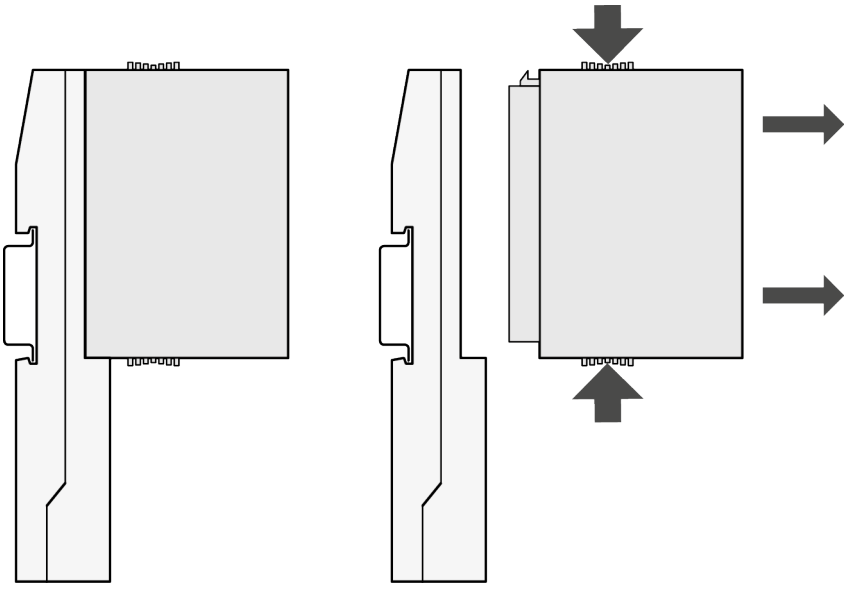
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

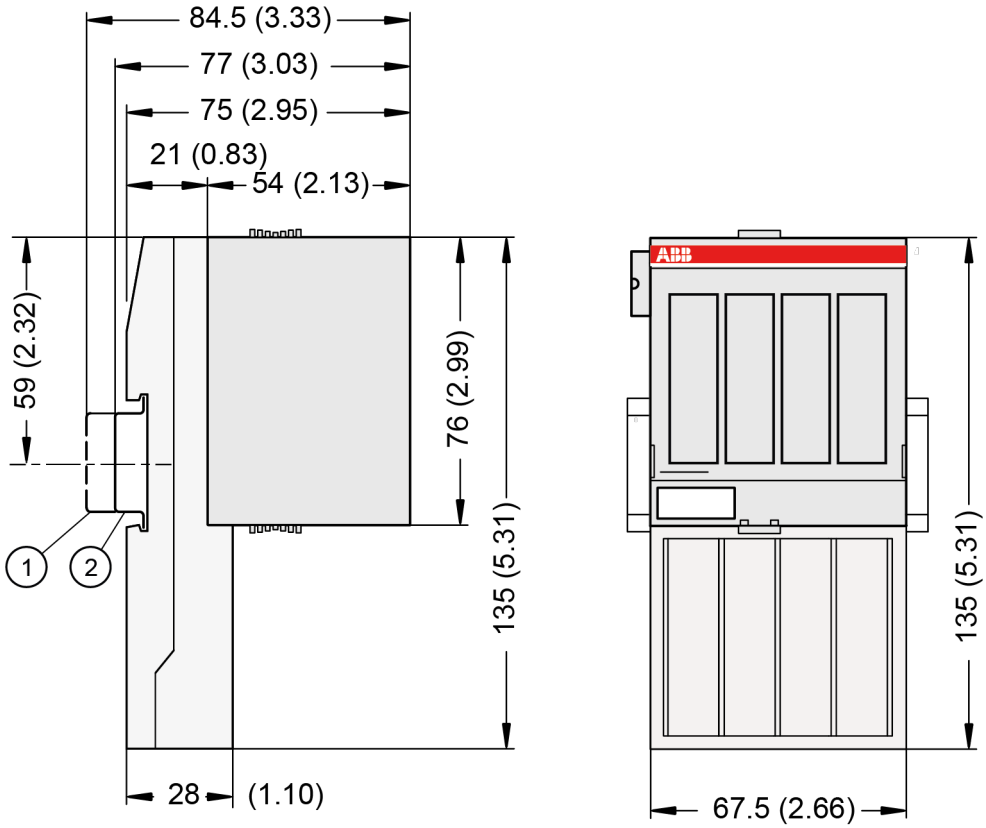
7.1 Assembly



7.2 Disassembly



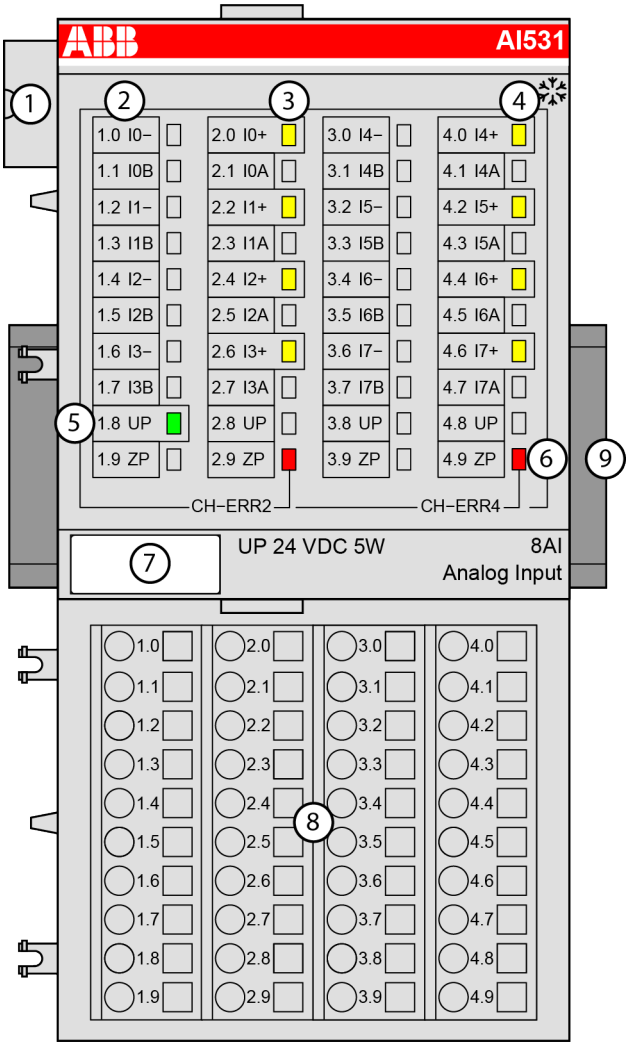
7.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

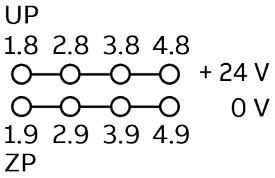
7.4 Connections



1 I/O bus
2 Allocation between terminal number and signal names
3 4 yellow LEDs to display the states at the inputs I0 ... I3
4 4 yellow LEDs to display the states at the inputs I4 ... I7
5 1 green LED to display the process supply voltage UP
6 2 red LEDs to display errors (CH-ERR2 and CH-ERR4)
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

7.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

7.4.2 Inputs

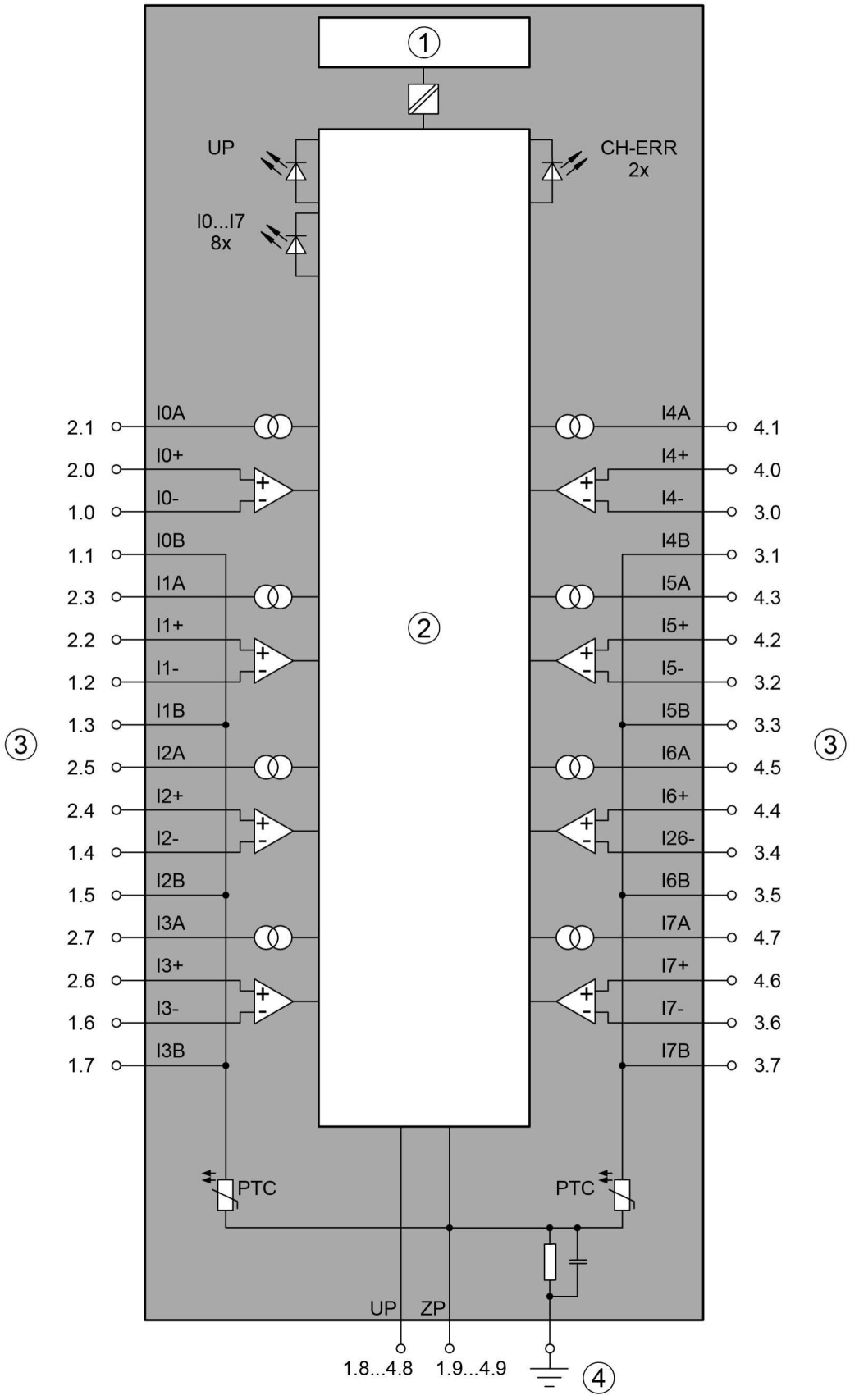
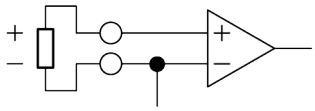


Fig. 11: 8 analog inputs in two groups, individually configurable

1 I/O bus interface
2 Logic
3 Analog inputs
4 Functional earth connection

Example

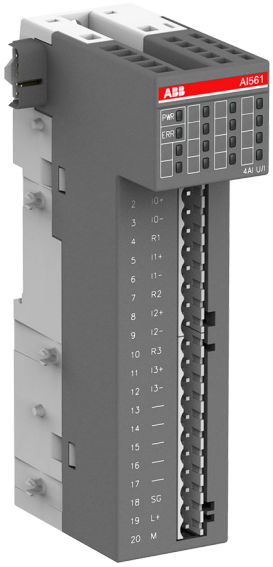


I0 ... I7
-50 mV... +50 mV
-500 mV ... +500 mV
-1 V ... +1 V
-5 V ... +5 V
-10 V... +10 V
0 V ... +5 V
0 V ... +10 V
0 mA ... +20 mA
+4 mA ... +20 mA
0 Ω ... 50 kΩ
Pt100 / Pt1000
Ni1000
Cu50
Thermo J, K, T, N, S
Digital Input

Fig. 12: Example of connection input

8 AI561

- AI561



CAUTION!

Risk of injury and damaging the product!

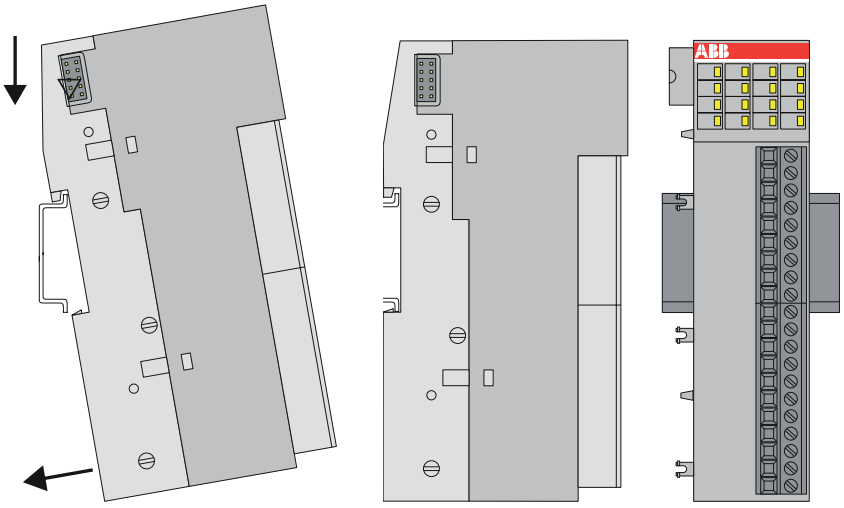
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

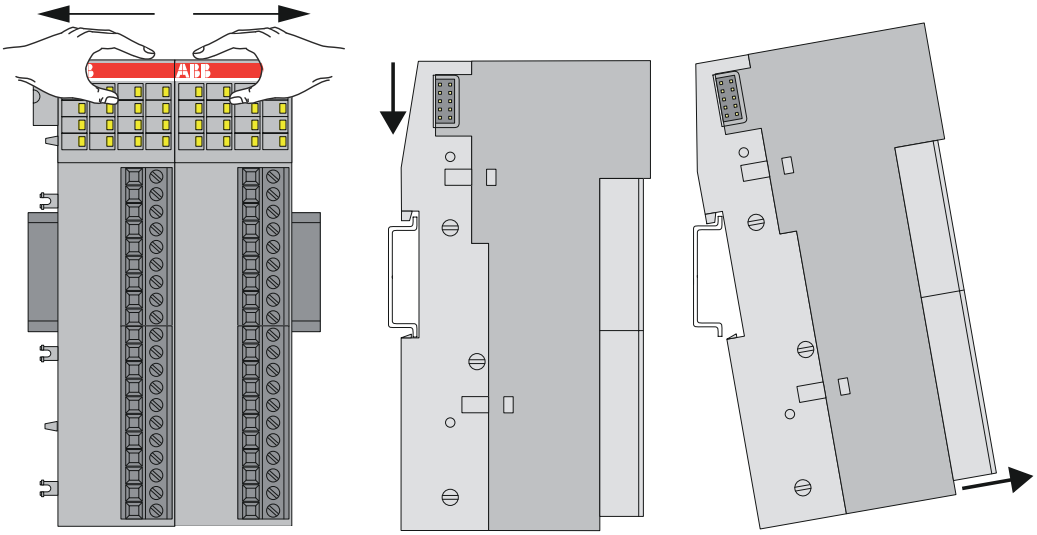
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

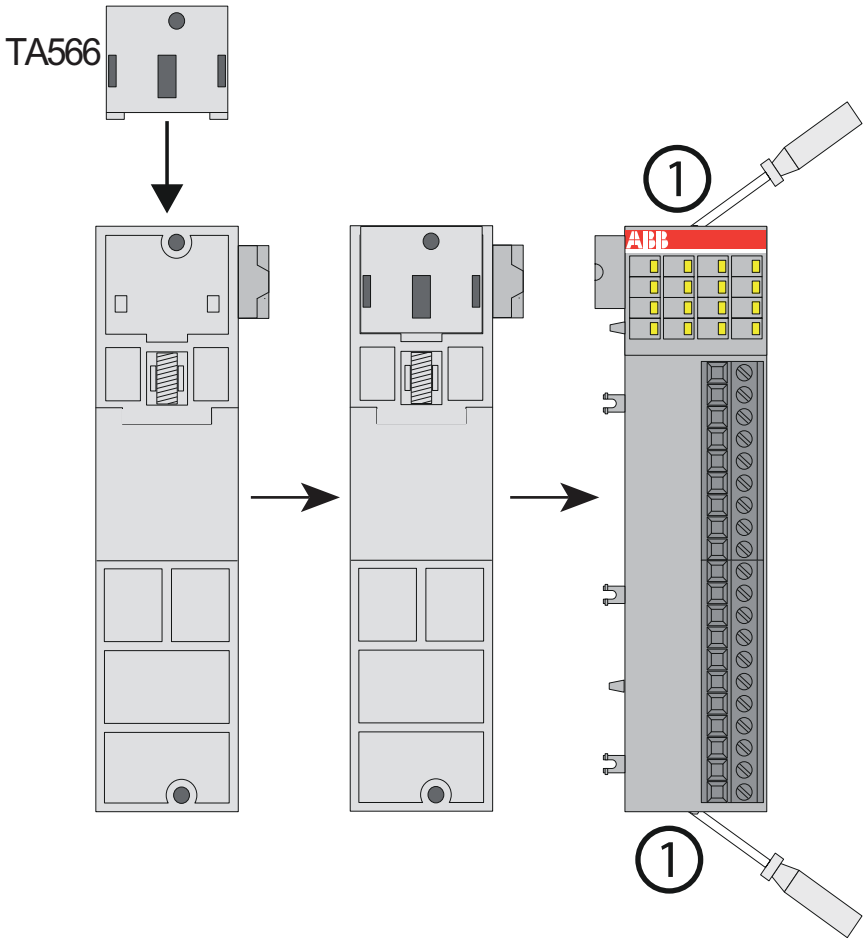
8.1 Assembly



8.2 Disassembly



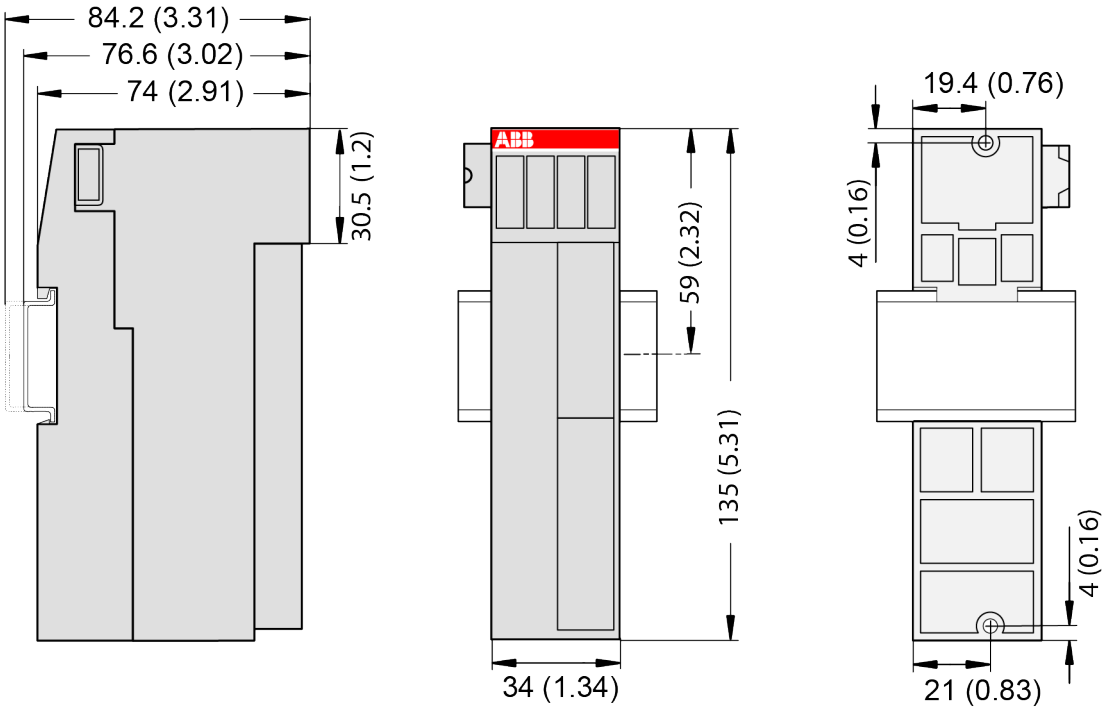
8.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

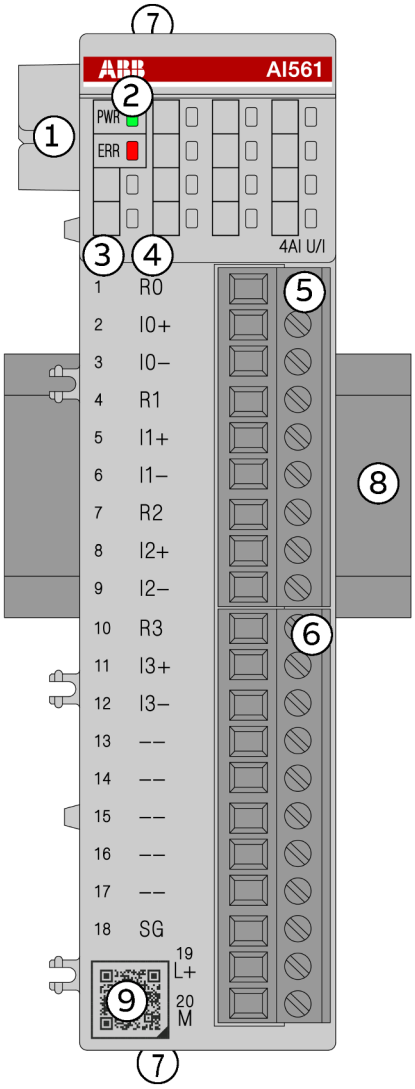
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

8.4 Dimensions



The dimensions are in mm and in brackets in inch.

8.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

8.5.1 Inputs

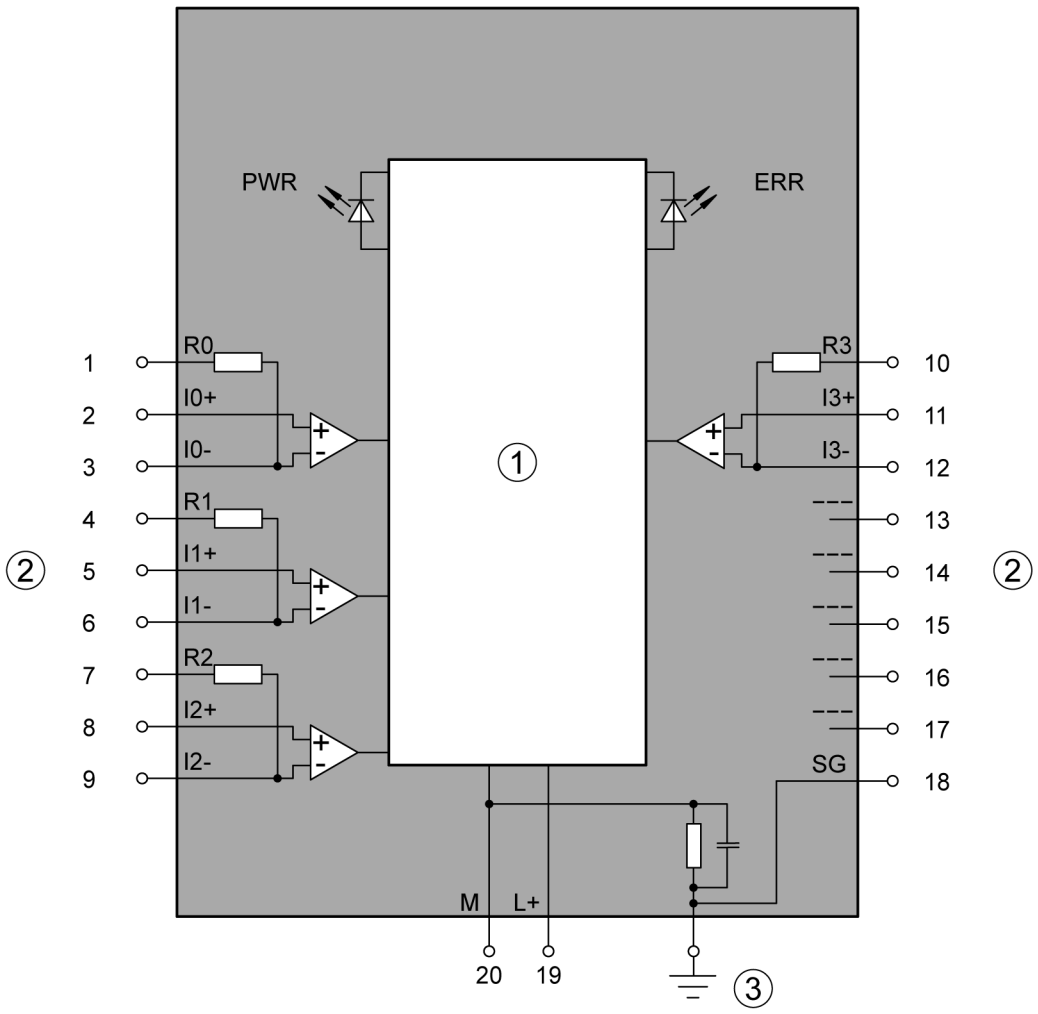
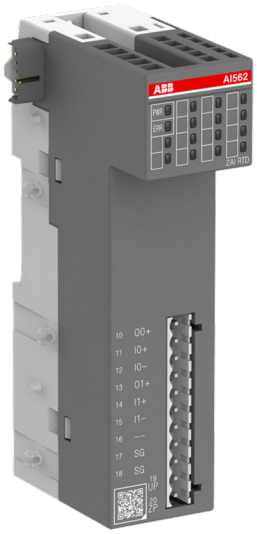


Fig. 13: Internal construction of the analog inputs

1 Logic - I/O bus interface
2 Analog inputs
3 Functional earth connection

9 AI562

- AI562



CAUTION!

Risk of injury and damaging the product!

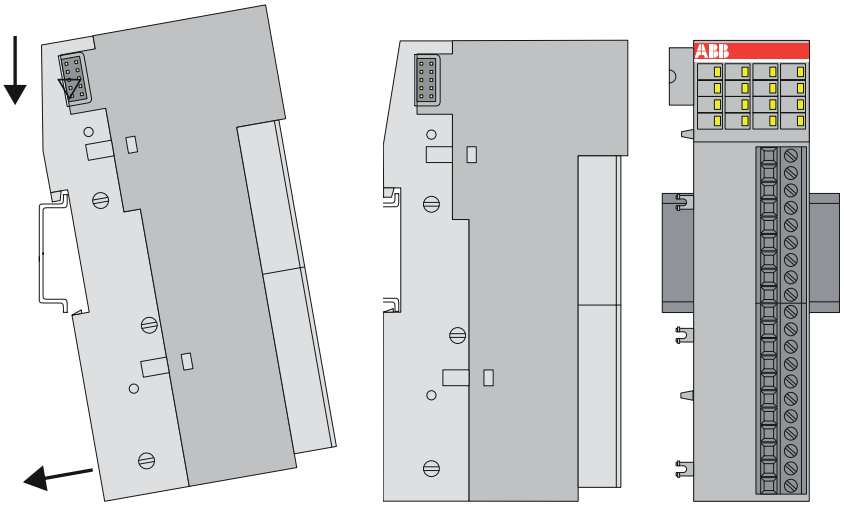
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

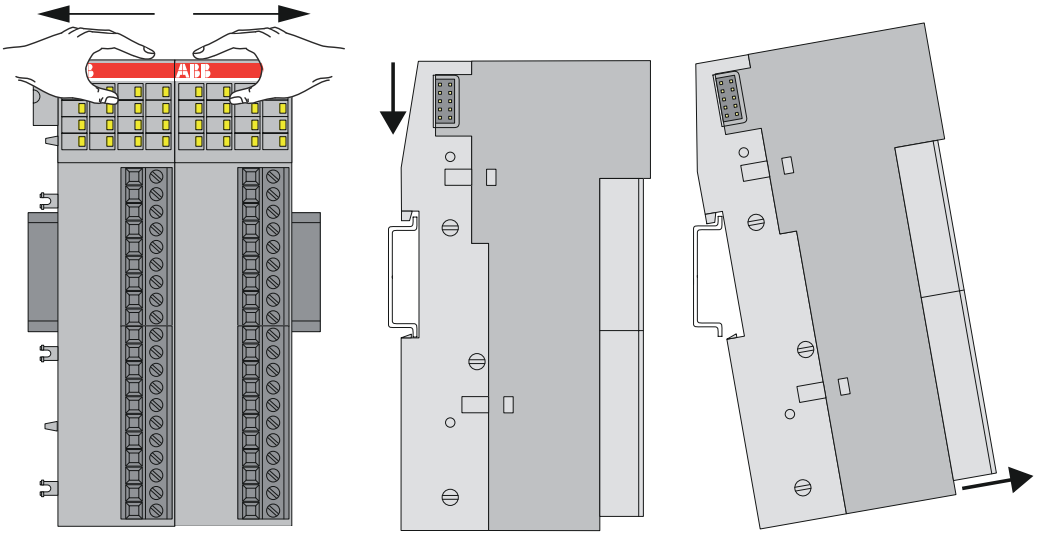
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

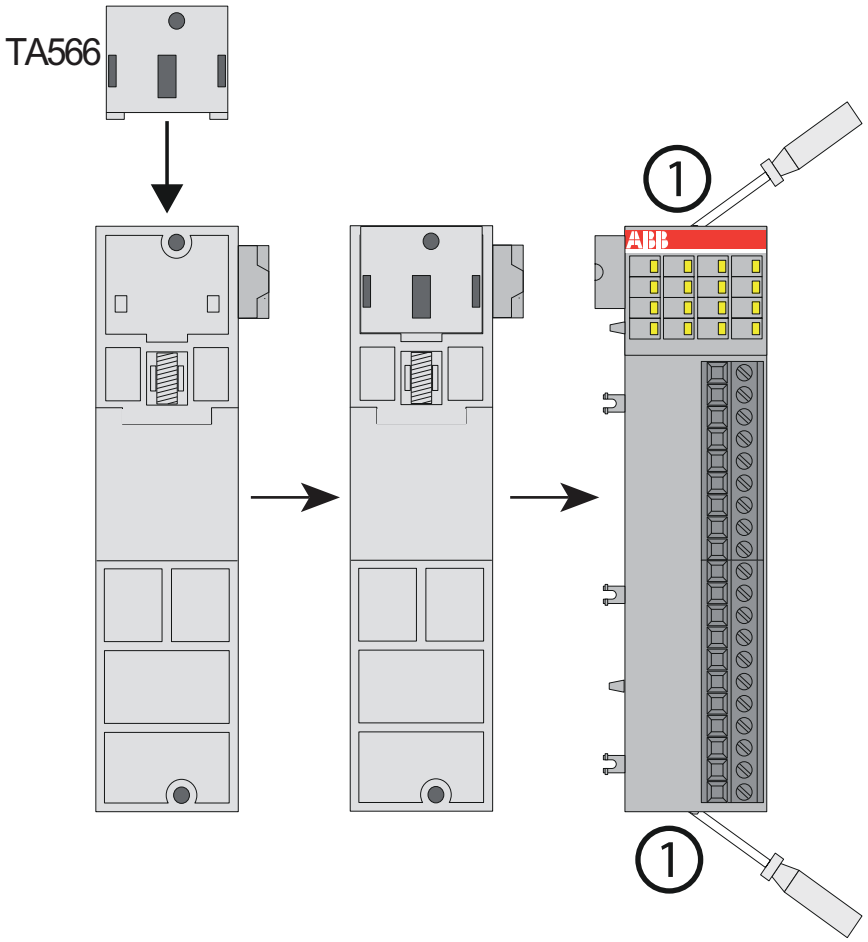
9.1 Assembly



9.2 Disassembly



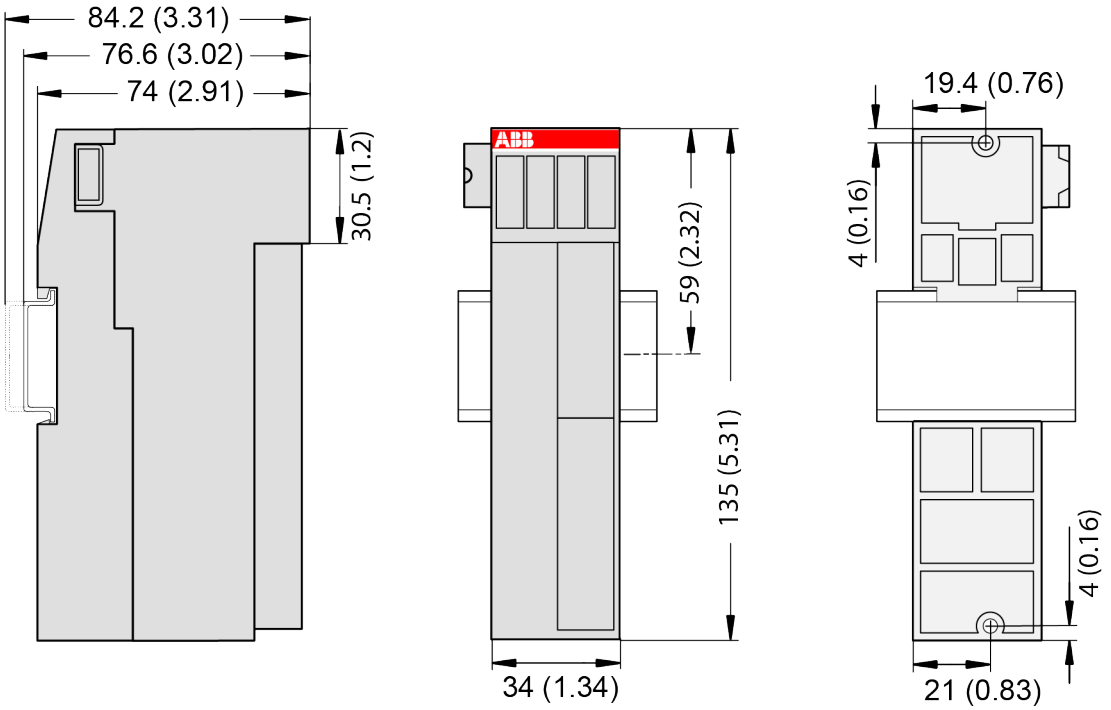
9.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

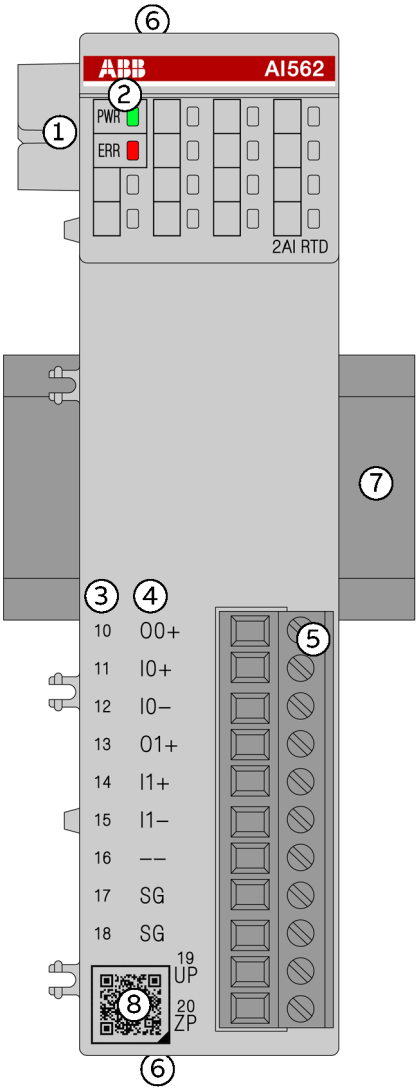
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

9.4 Dimensions



The dimensions are in mm and in brackets in inch.

9.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (11-pin)
6 2 holes for wall-mounting with screws
7 DIN rail
8 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-11	11-pin, screw, cable from front
	TA564-11	11-pin, screw, cable from side
	TA565-11	11-pin, spring, cable from front

9.5.1 Inputs

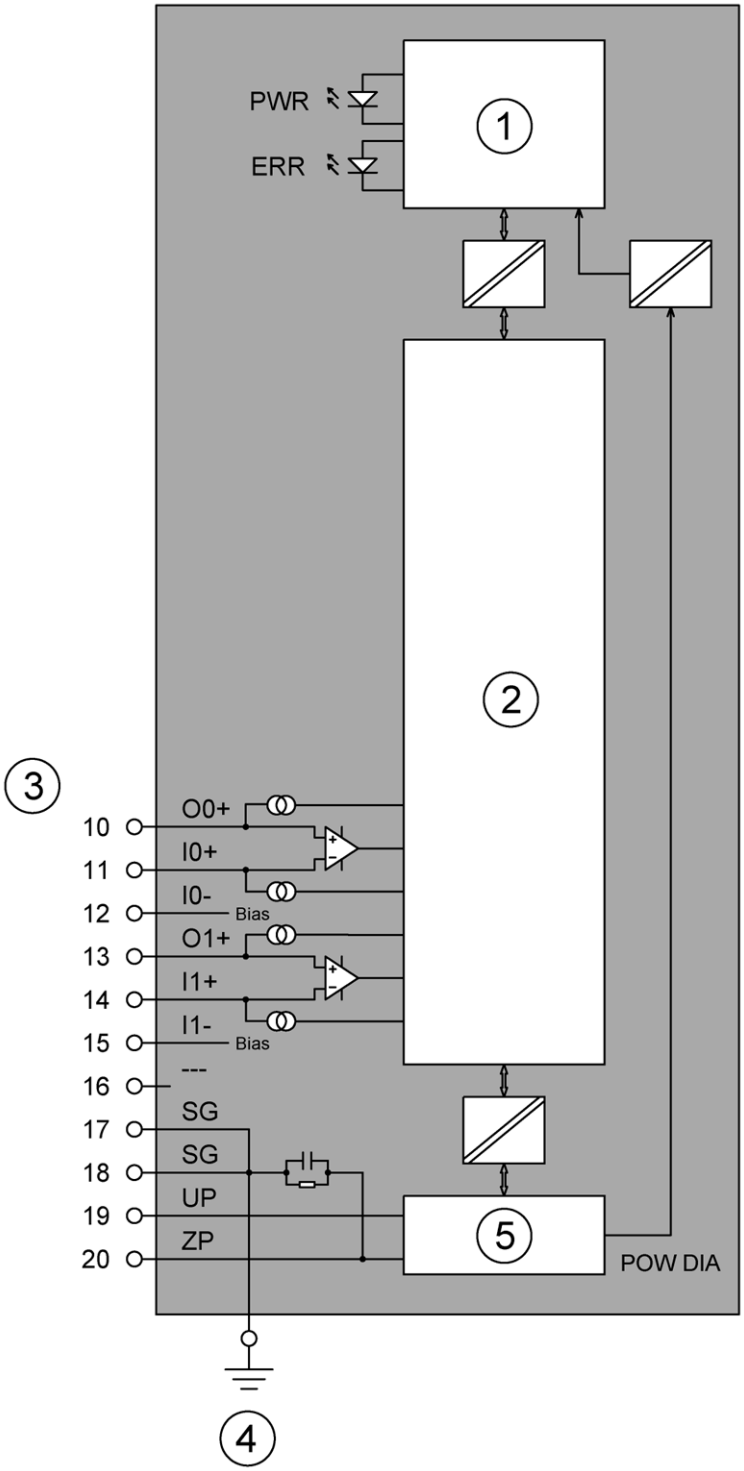
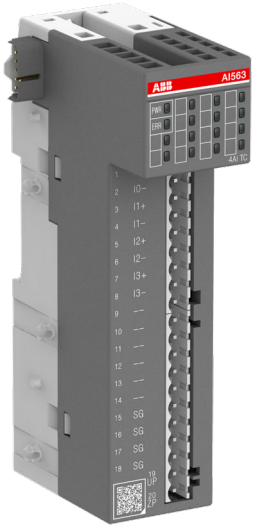


Fig. 14: Internal construction of the analog inputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog inputs circuit
4 Functional earth connection
5 Fly-back DC/DC power supply

10 AI563

- AI563



CAUTION!

Risk of injury and damaging the product!

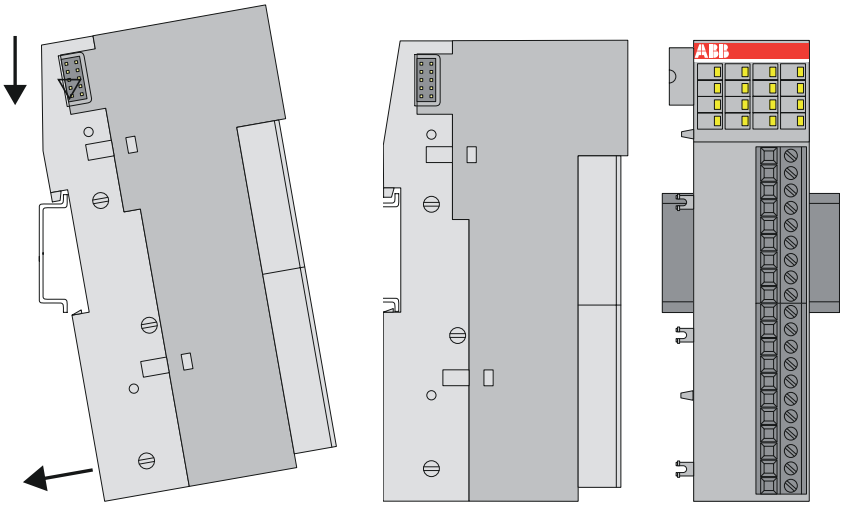
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

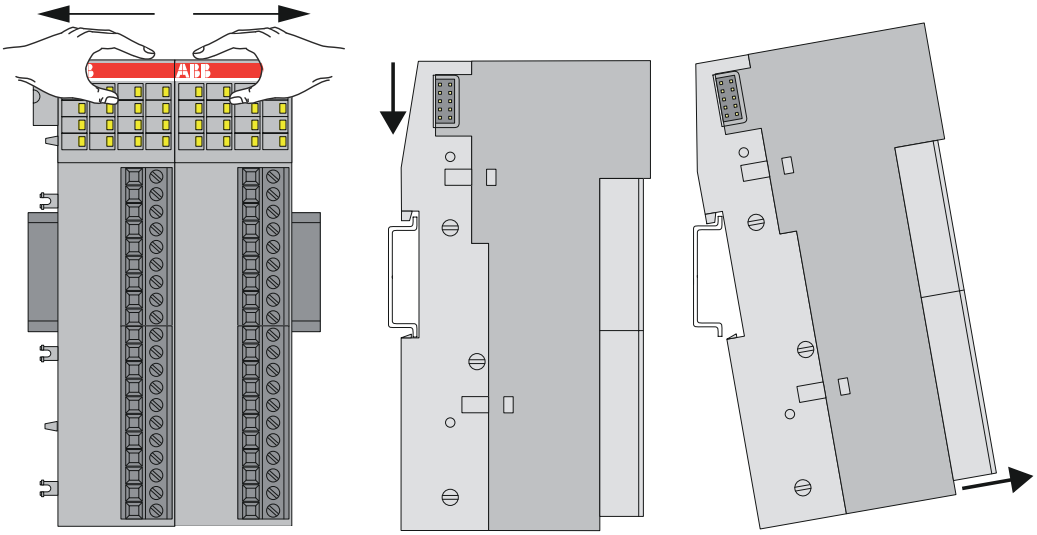
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

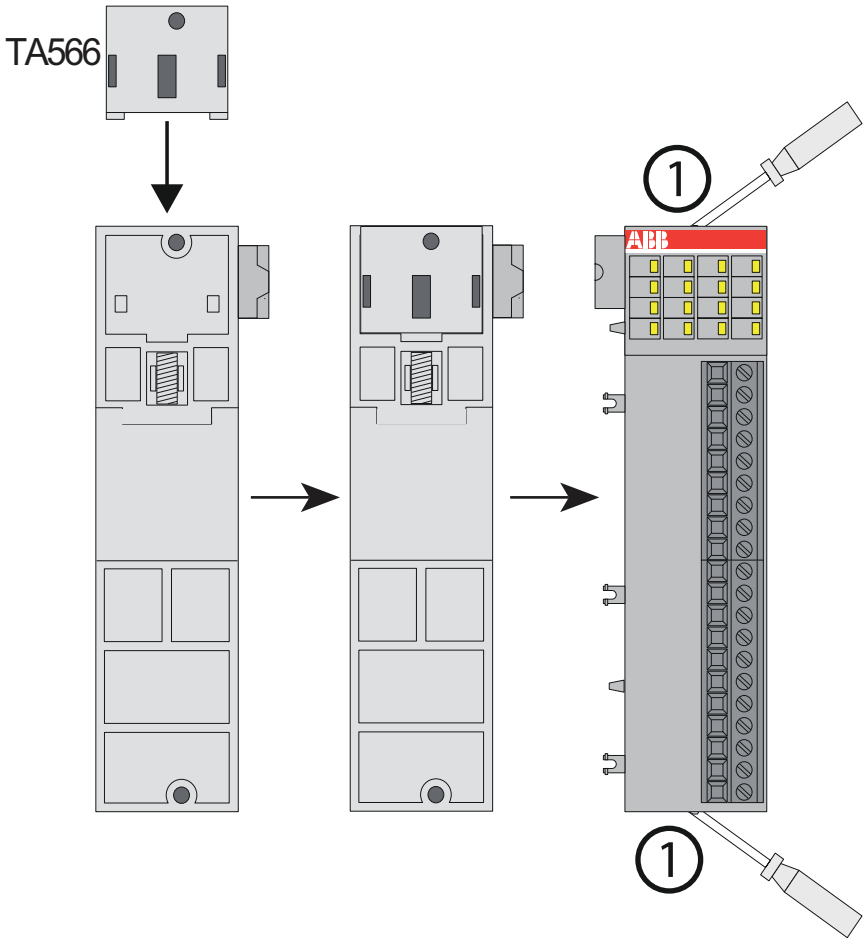
10.1 Assembly



10.2 Disassembly



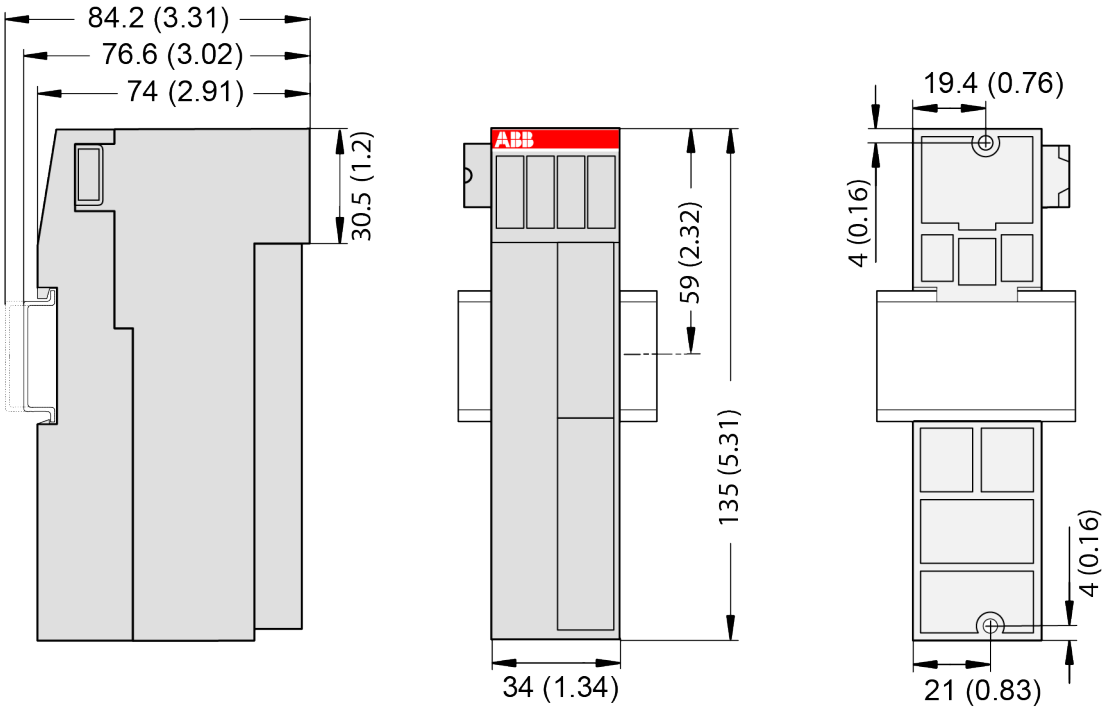
10.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

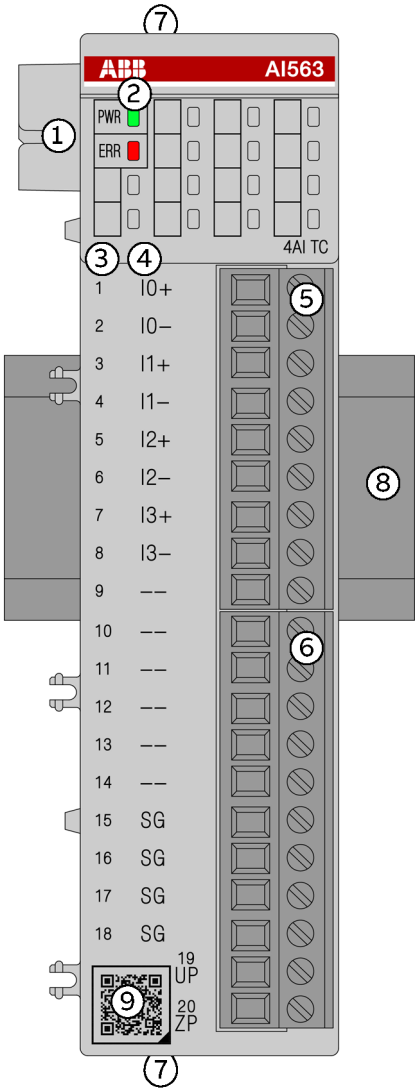
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

10.4 Dimensions



The dimensions are in mm and in brackets in inch.

10.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

10.5.1 Inputs

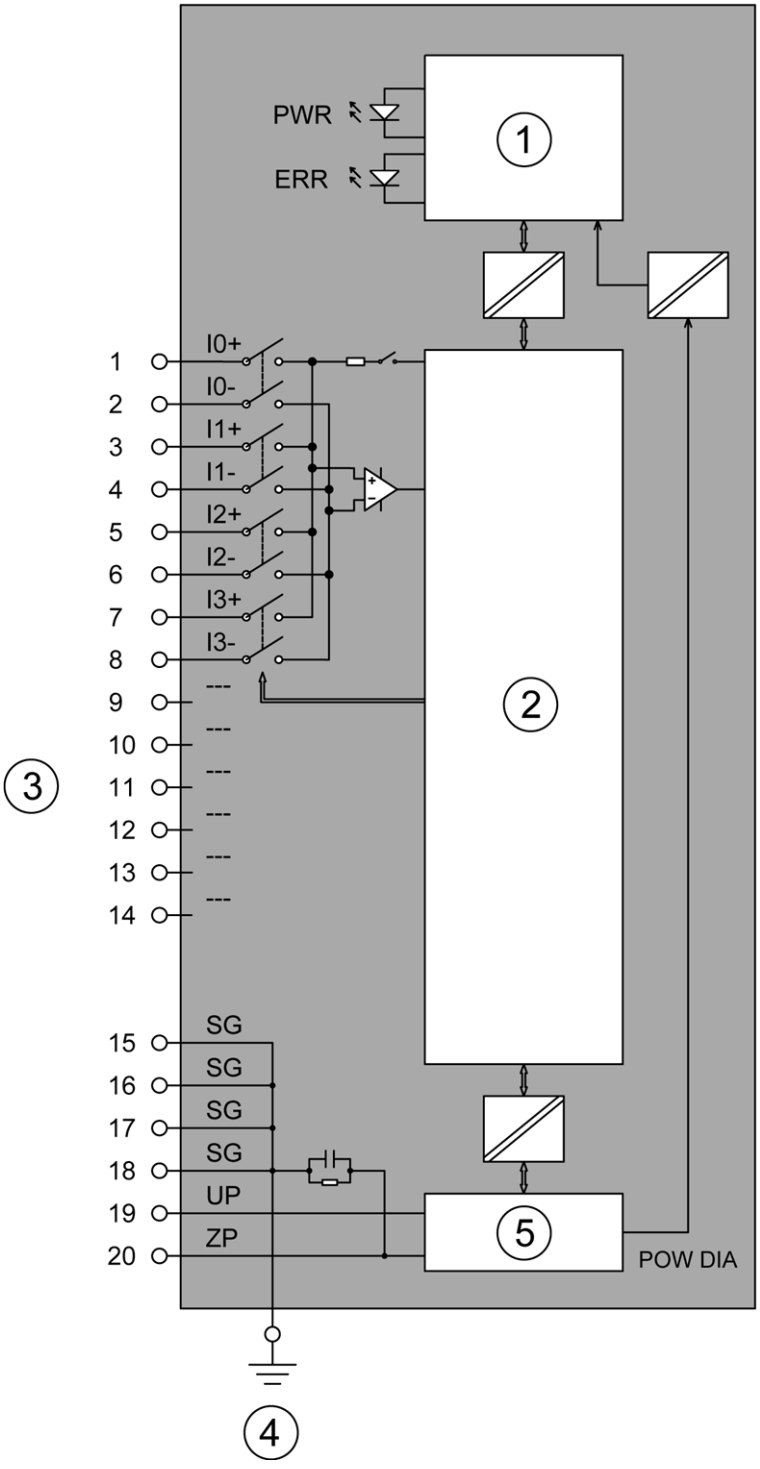
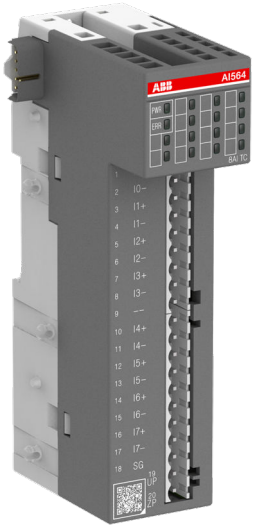


Fig. 15: Internal construction of the analog inputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog inputs circuit
4 Functional earth connection
5 Fly-back DC/DC power supply

11 AI564

- AI564



CAUTION!

Risk of injury and damaging the product!

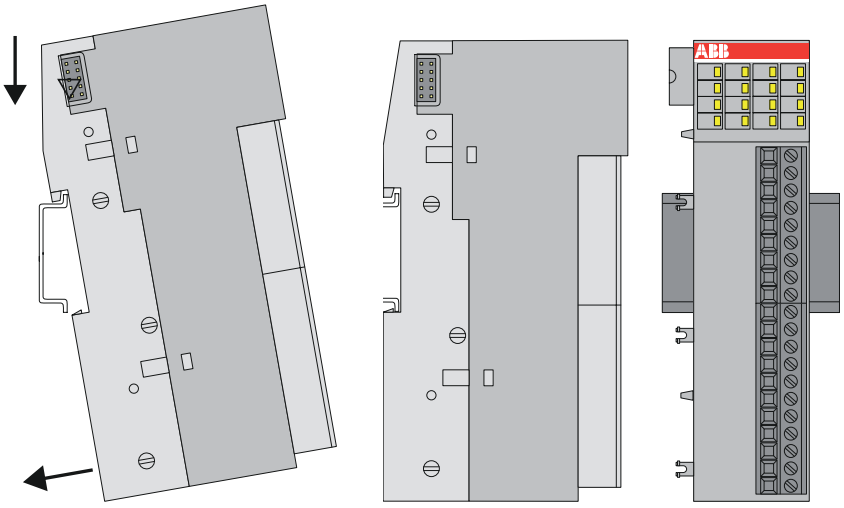
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

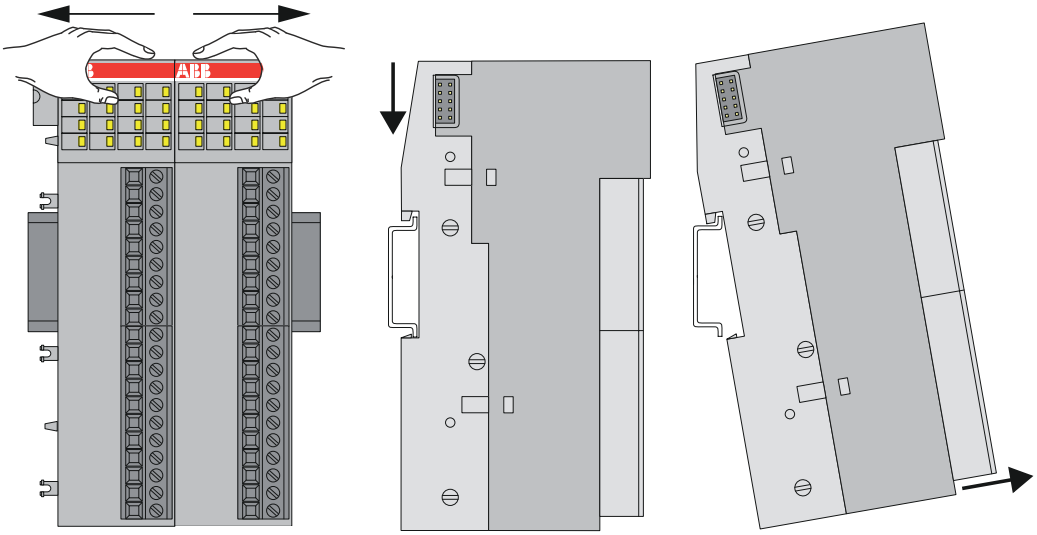
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

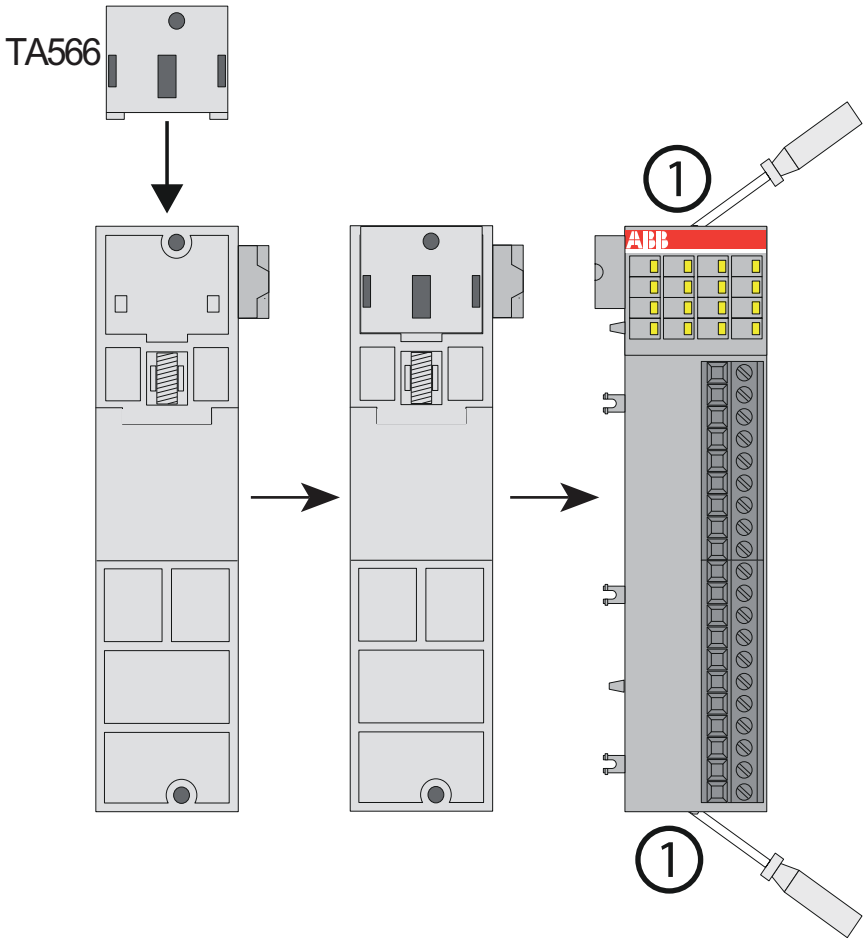
11.1 Assembly



11.2 Disassembly



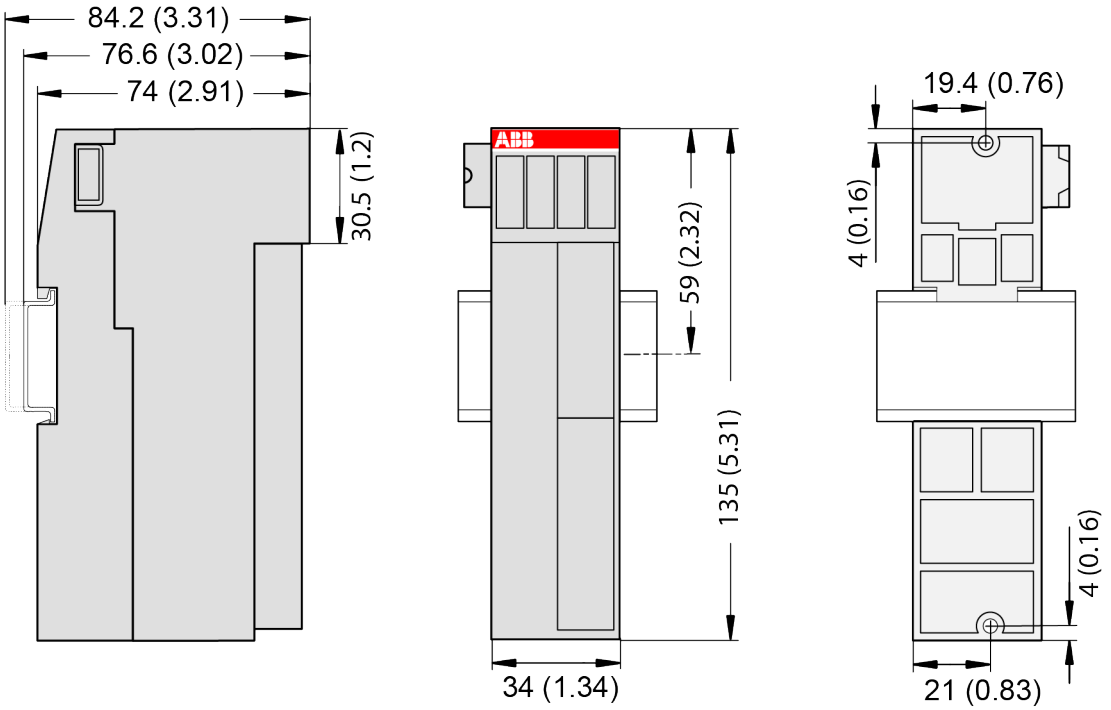
11.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

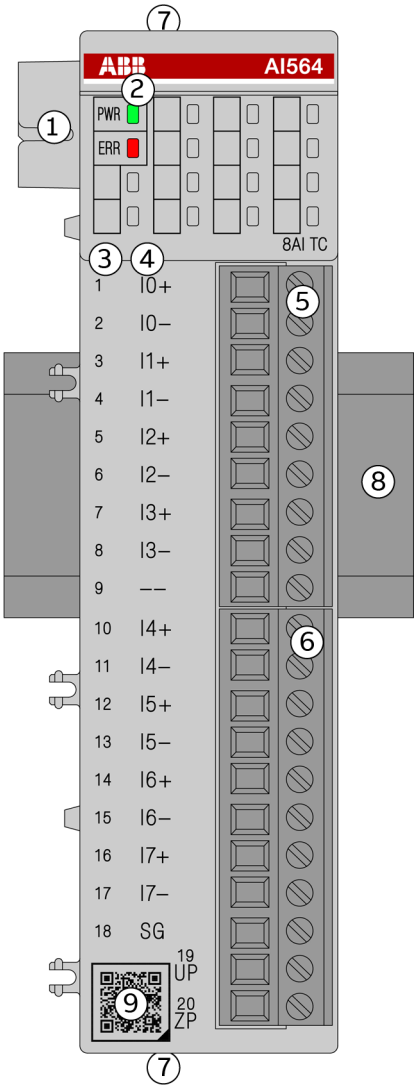
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

11.4 Dimensions



The dimensions are in mm and in brackets in inch.

11.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

11.5.1 Inputs

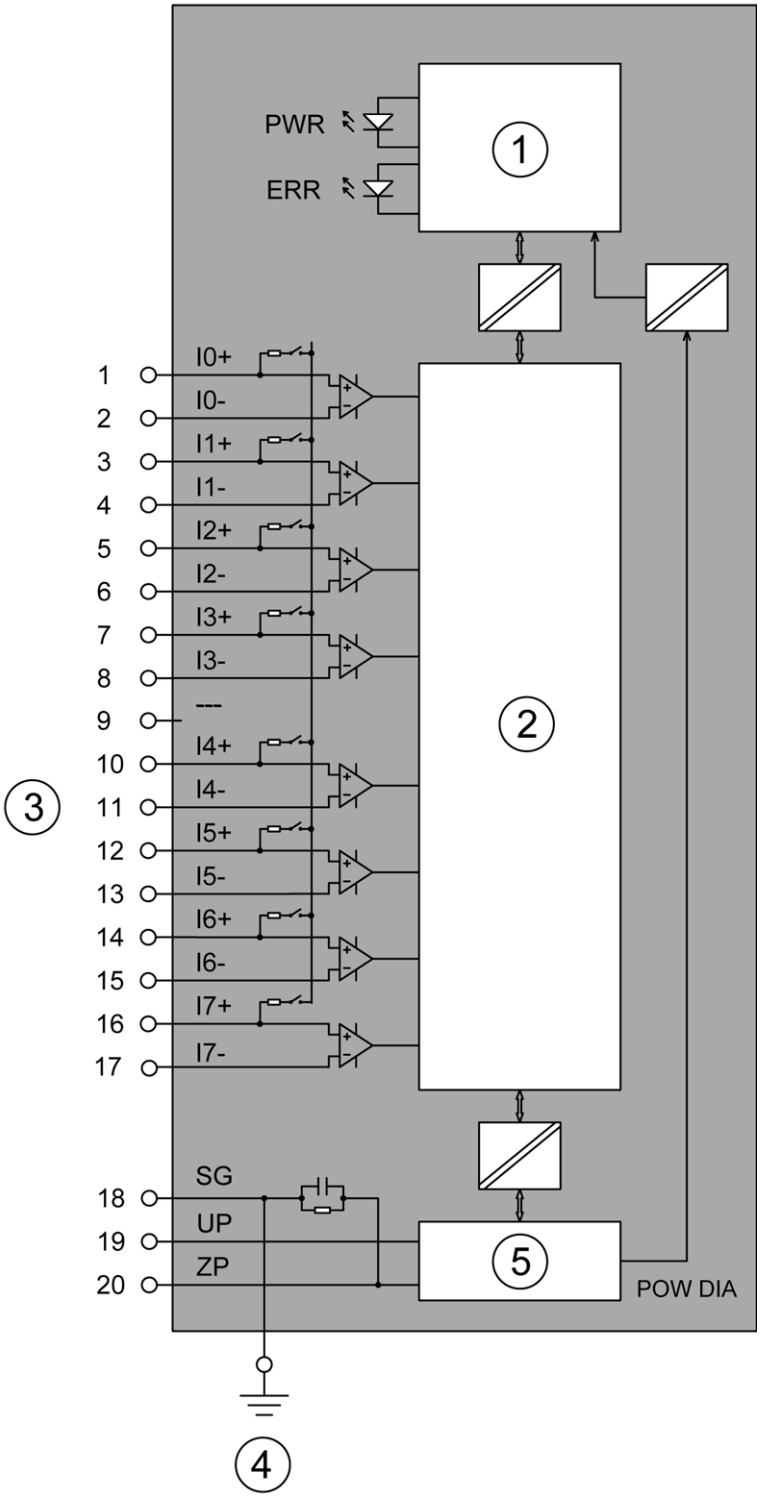
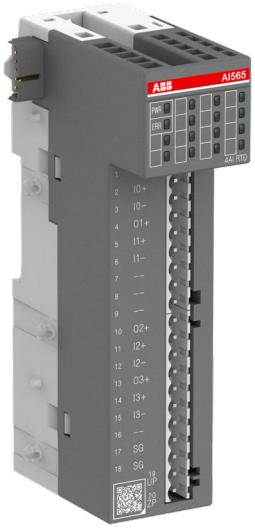


Fig. 16: Internal construction of the analog inputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog inputs circuit
4 Functional earth connection
5 Fly-back DC/DC power supply

12 AI565

- AI565



CAUTION!

Risk of injury and damaging the product!

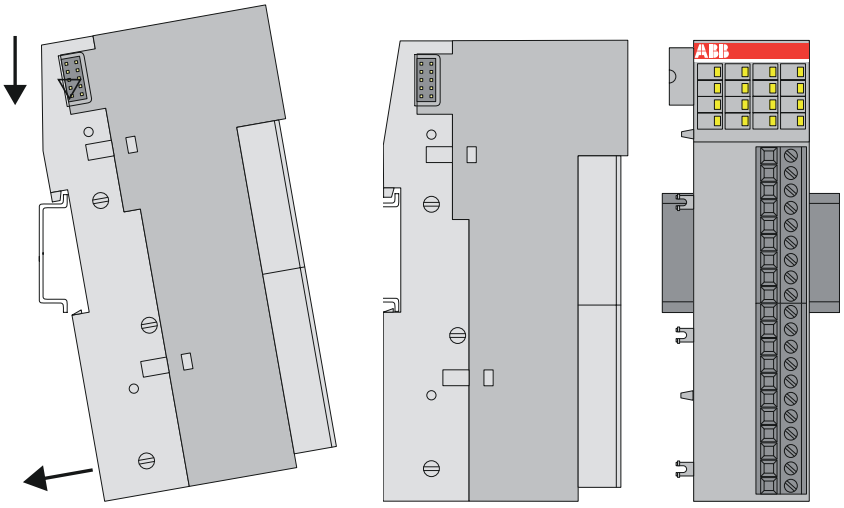
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

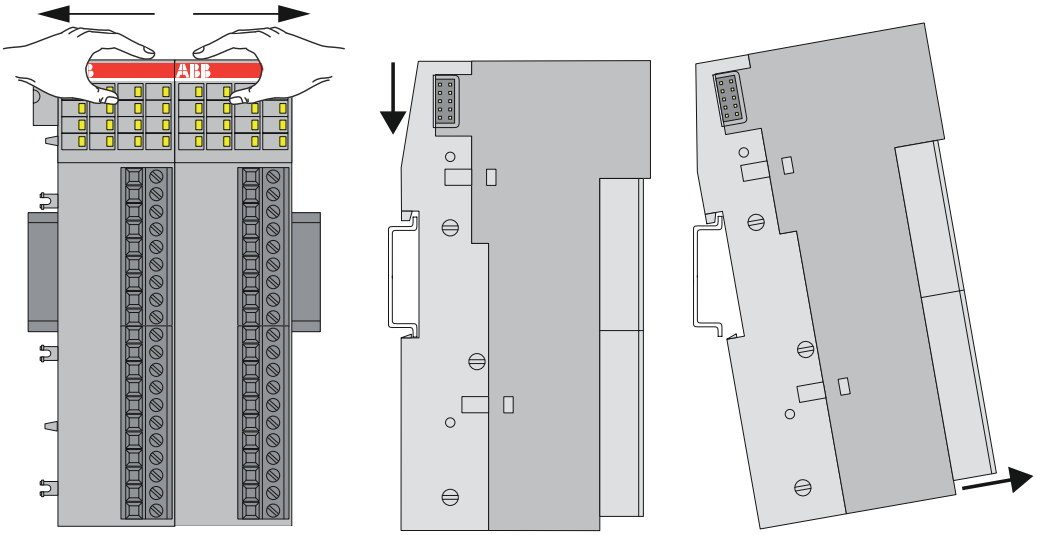
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

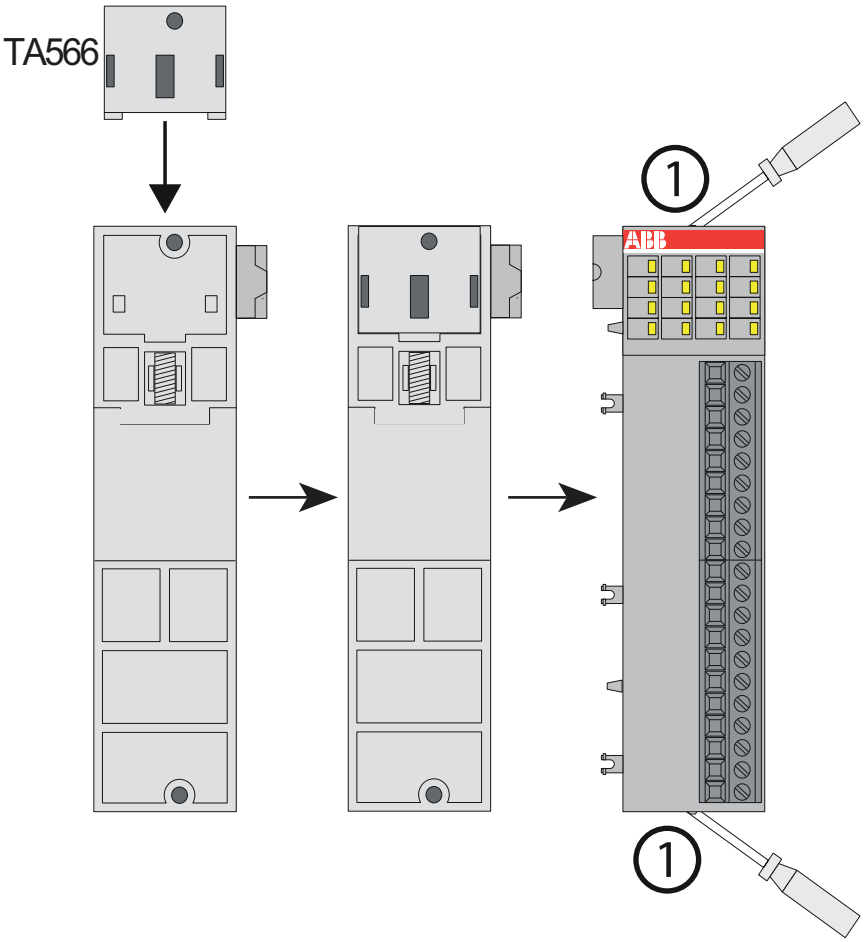
12.1 Assembly



12.2 Disassembly



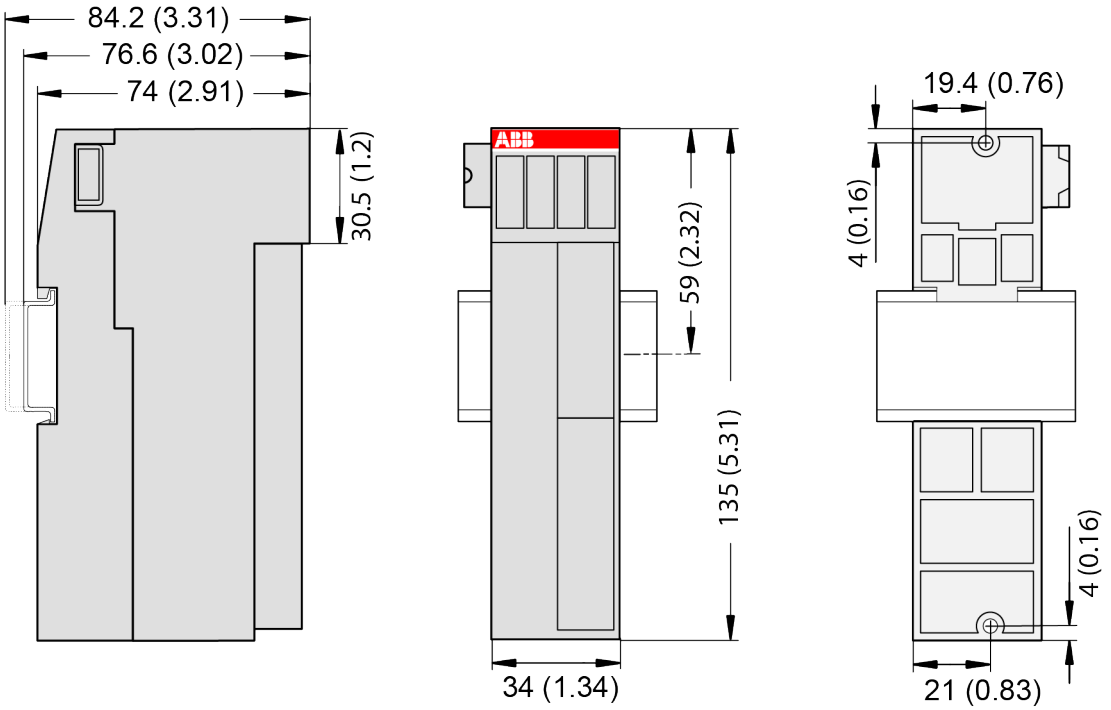
12.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

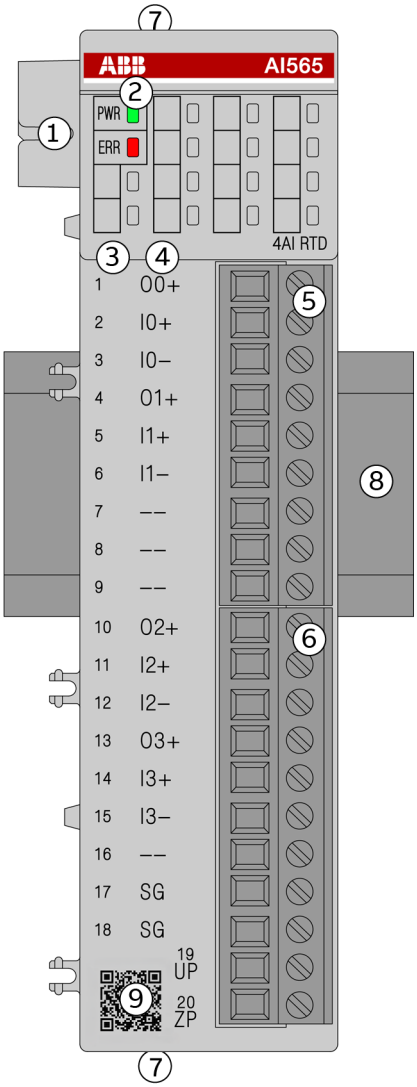
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

12.4 Dimensions



The dimensions are in mm and in brackets in inch.

12.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front

	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

12.5.1 Inputs

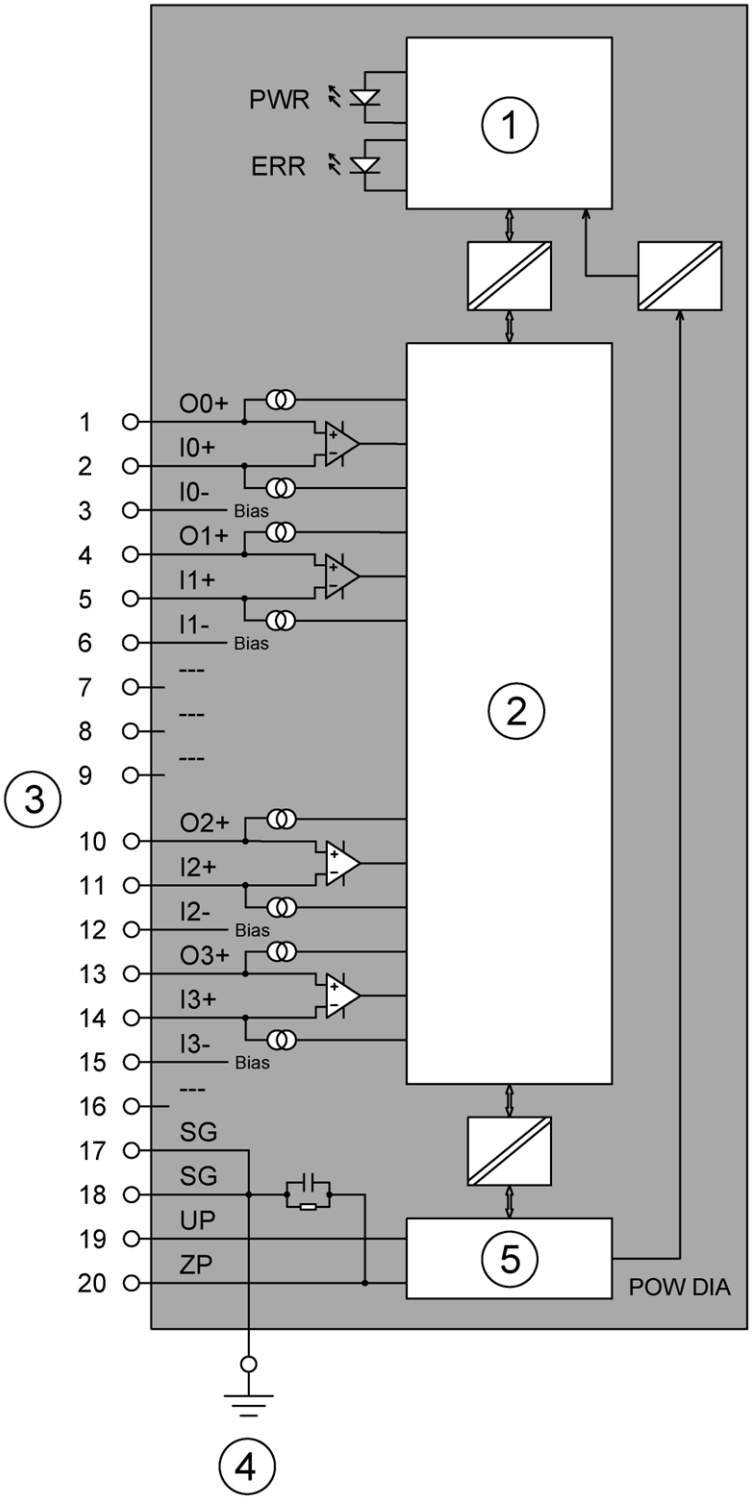
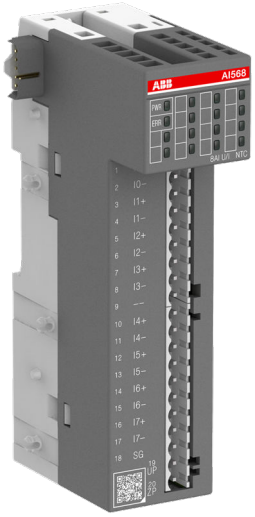


Fig. 17: Internal construction of the analog inputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog inputs circuit
4 Functional earth connection
5 Fly-back DC/DC power supply

13 AI568

- AI568



CAUTION!

Risk of injury and damaging the product!

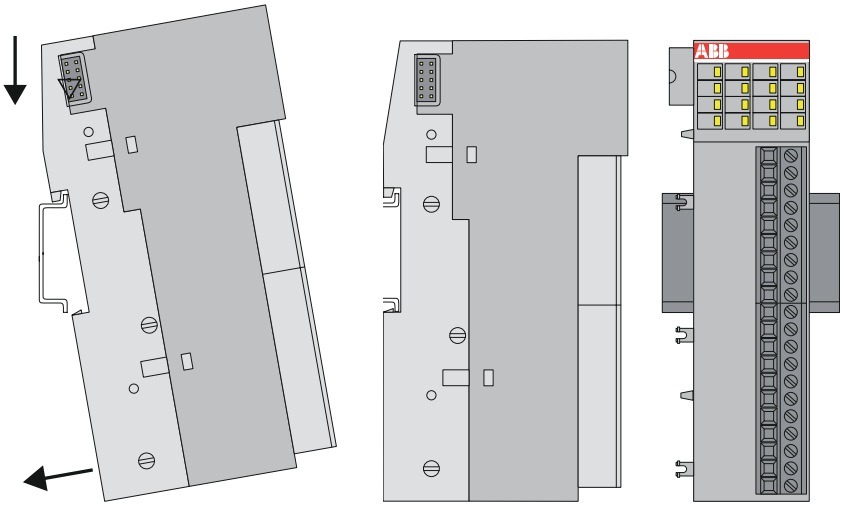
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

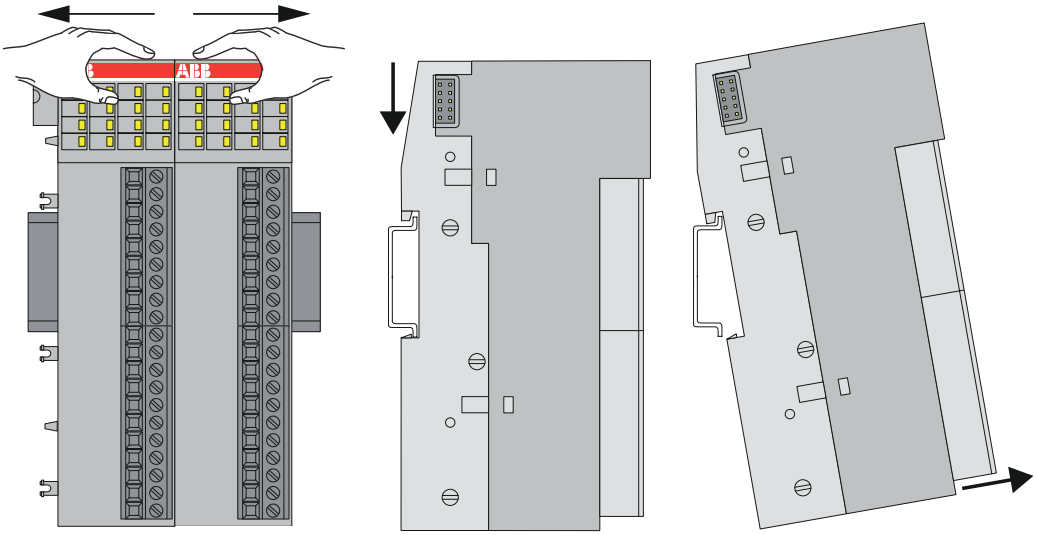
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

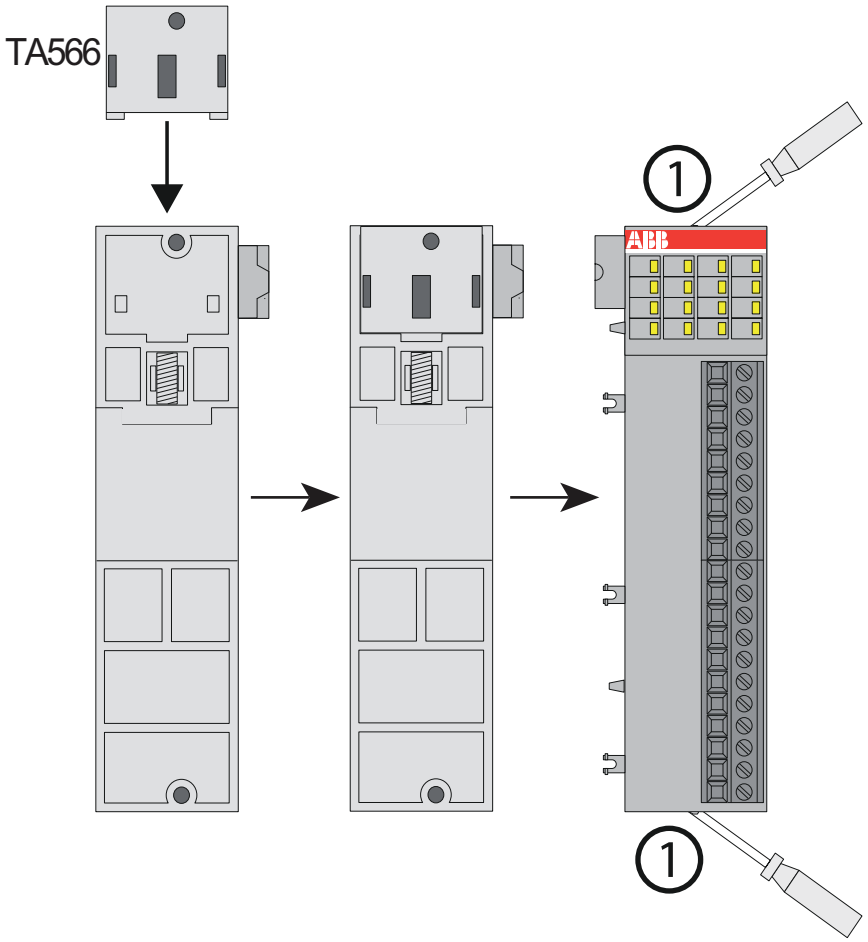
13.1 Assembly



13.2 Disassembly



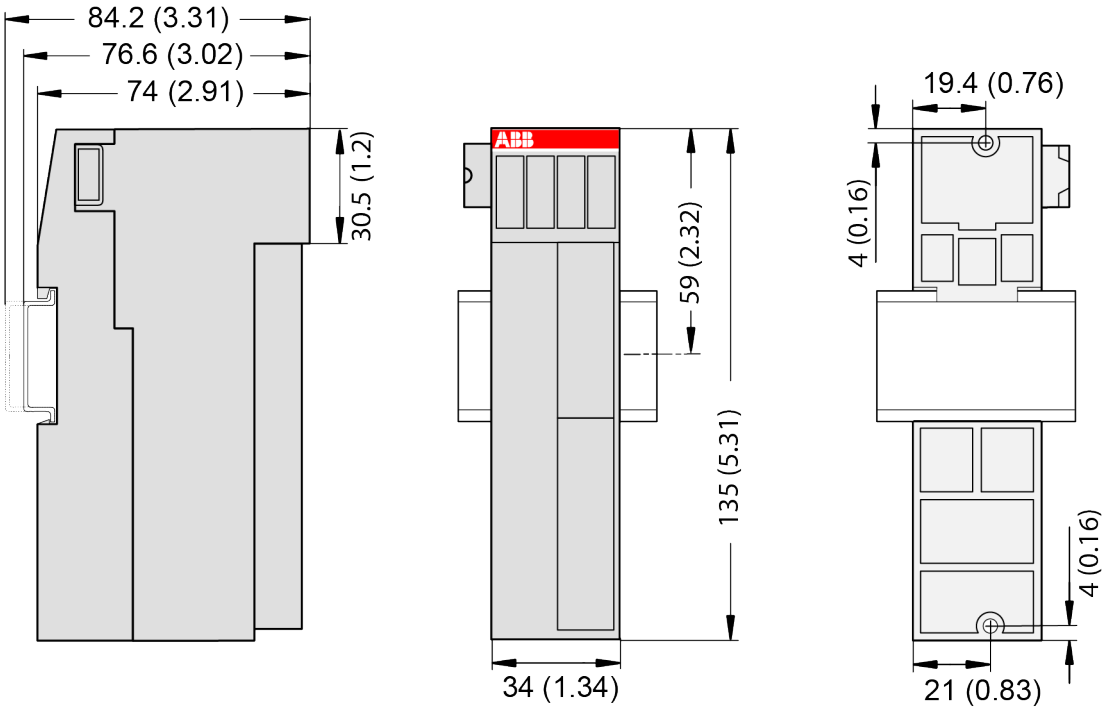
13.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

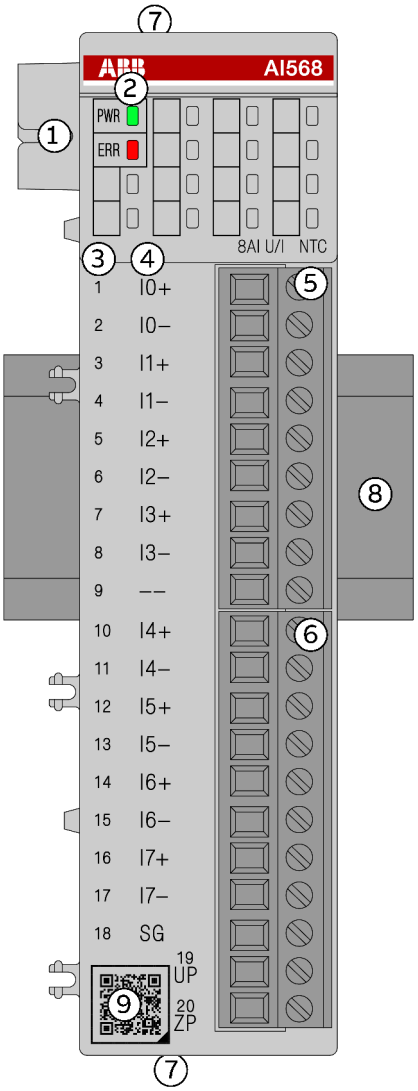
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

13.4 Dimensions



The dimensions are in mm and in brackets in inch.

13.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

13.5.1 Inputs

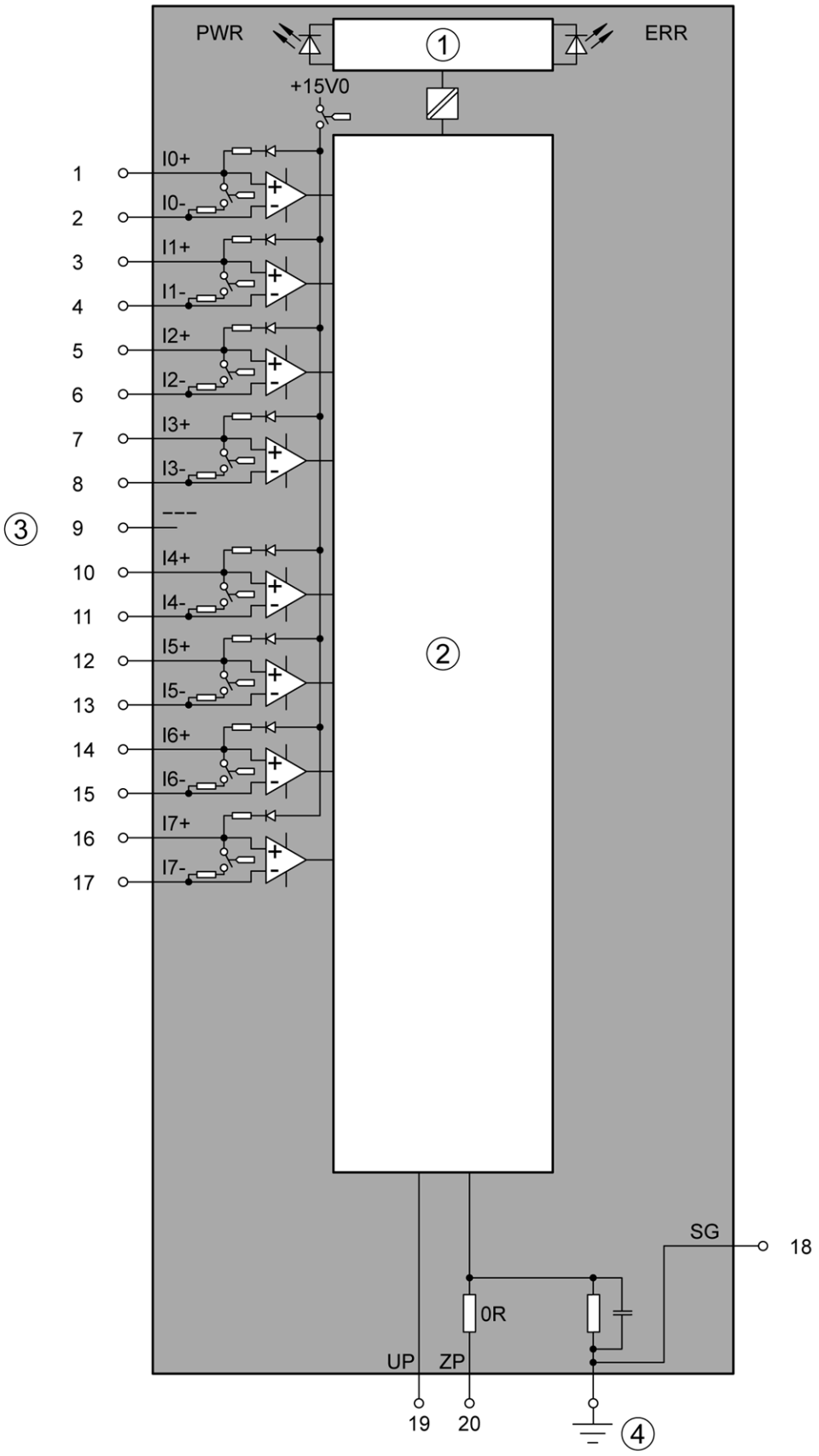
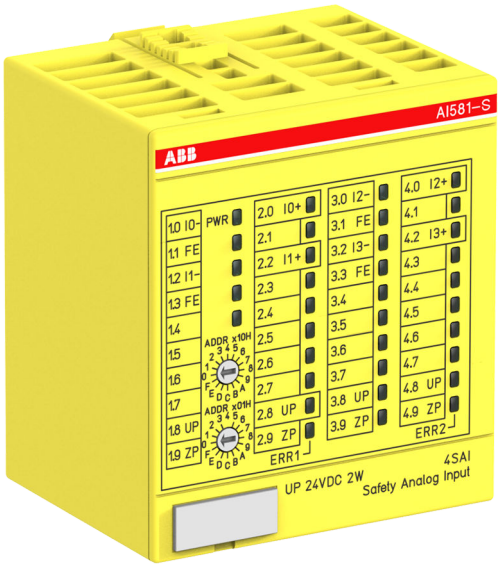


Fig. 18: Internal construction of the analog inputs

1 I/O bus interface and MCU core circuit
2 ADC, logic circuit and DC/DC power
3 Analog inputs
4 Functional earth connection

14 AI581-S(-XC)

- AI581-S
- AI581-S-XC



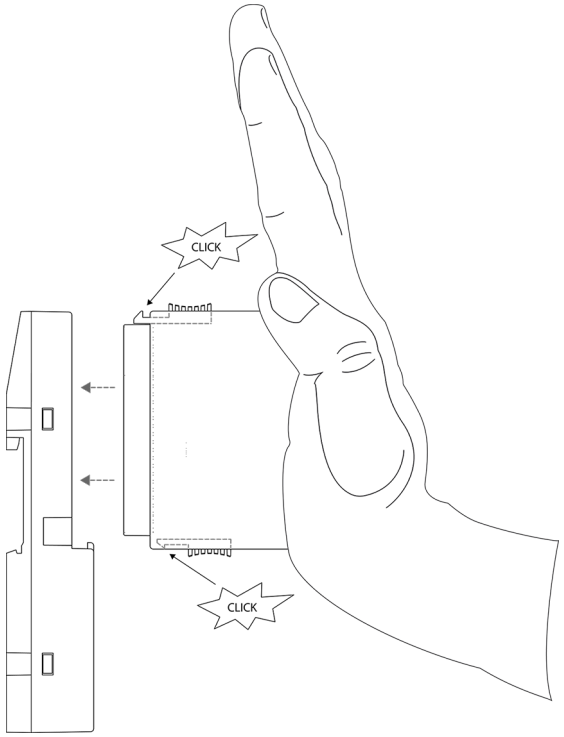
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

14.1 Assembly

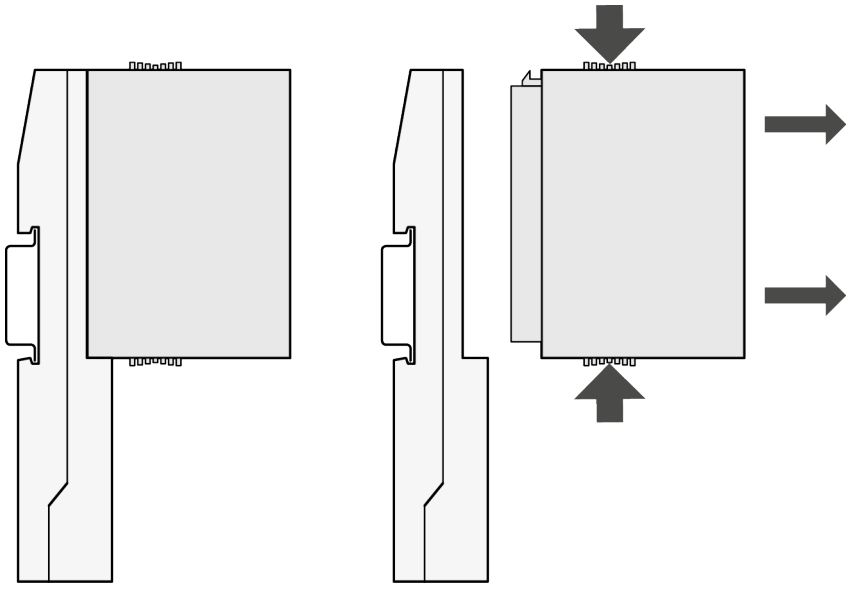


1. Put the module on the terminal unit

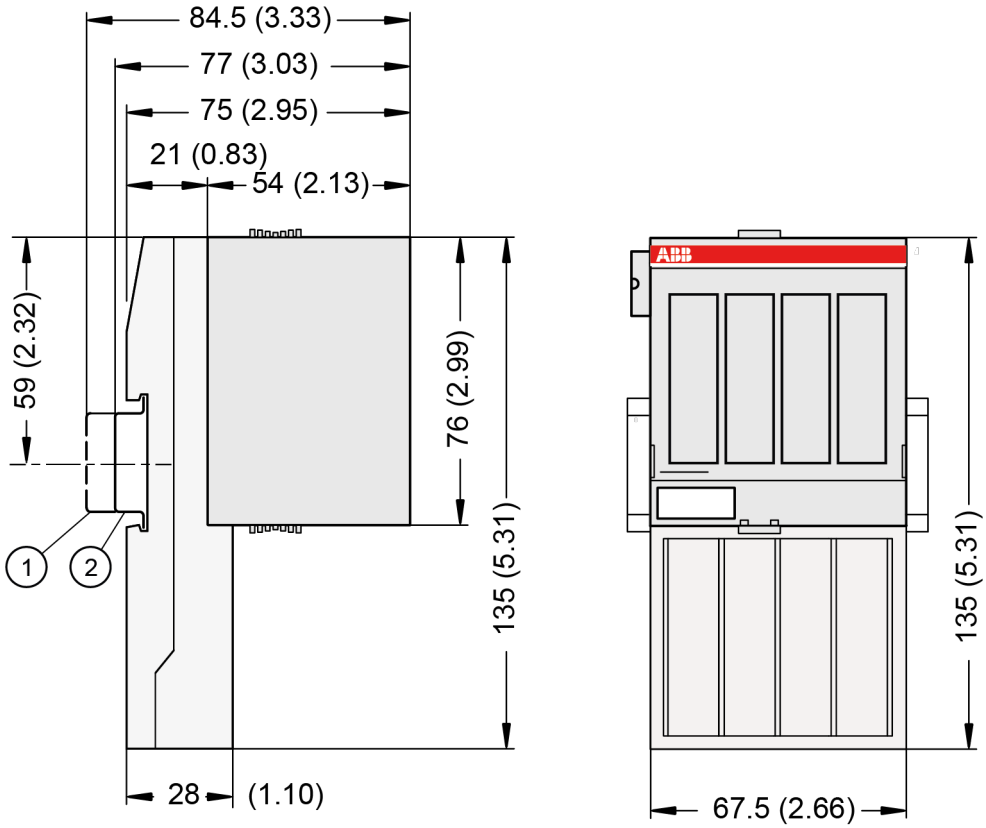
   ⇨ Module clicks in.

2. Then press the module with a force of at least 100 N into the terminal unit to achieve proper electrical contact.

14.2 Disassembly



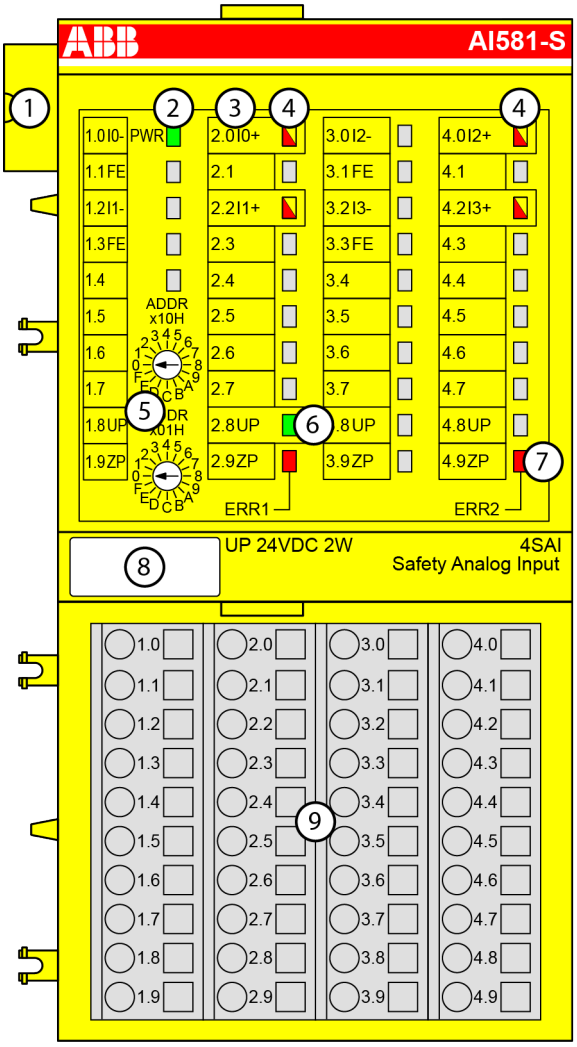
14.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

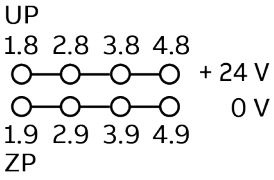
> *The dimensions are in mm and in brackets in inch.*

14.4 Connections



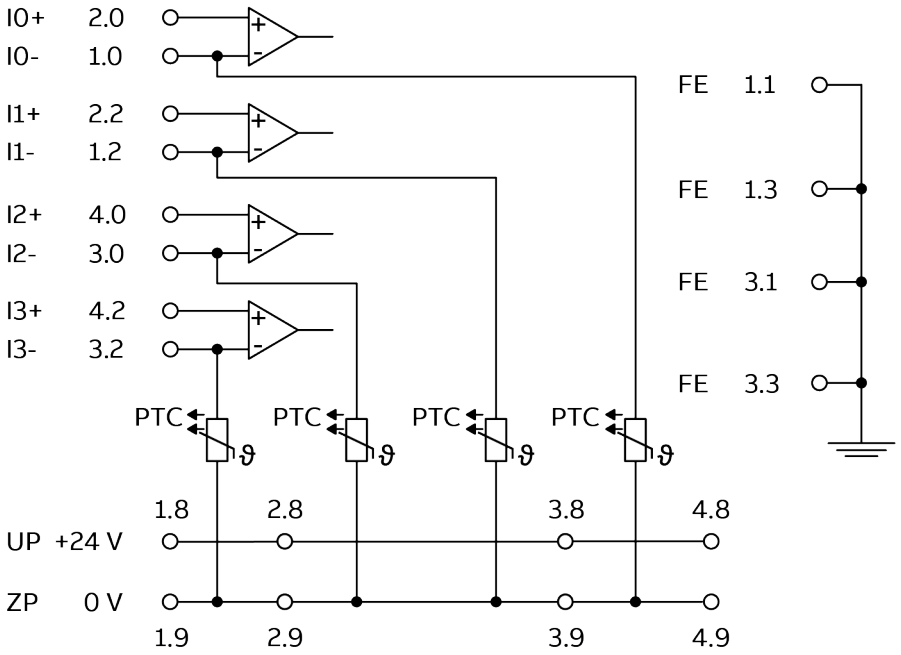
1 I/O bus
2 System LED
3 Allocation of terminal number and signal name
4 4 yellow/red LEDs to display the signal states of the analog inputs
5 2 rotary switches for setting the PROFIsafe address
6 1 green LED to display the state of the process supply voltage UP
7 2 red LEDs to display errors
8 Label
9 Terminal unit TU582-S(-XC)
❄ Sign for XC version

14.4.1 Process supply voltage

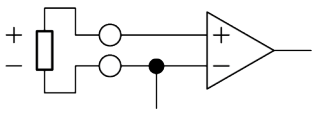


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

14.4.2 Inputs



Example



I0 ... I3
0 mA ... +20 mA +4 mA ... +20 mA

Fig. 19: Example of connection input

AC500-S safety user manual
For a detailed description of the connection of the module, please refer to the "AC500-S safety user manual".

15 AO522 (-XC)

- AO522
- AO522-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

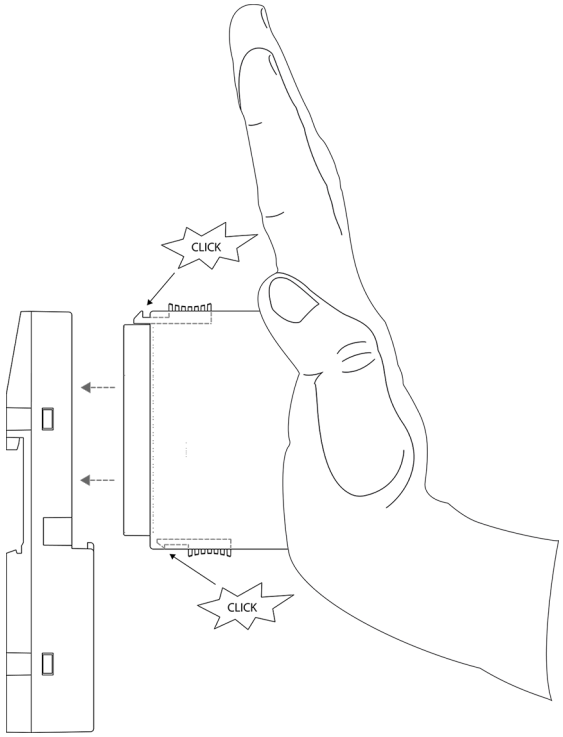
NOTICE!

Hot swap

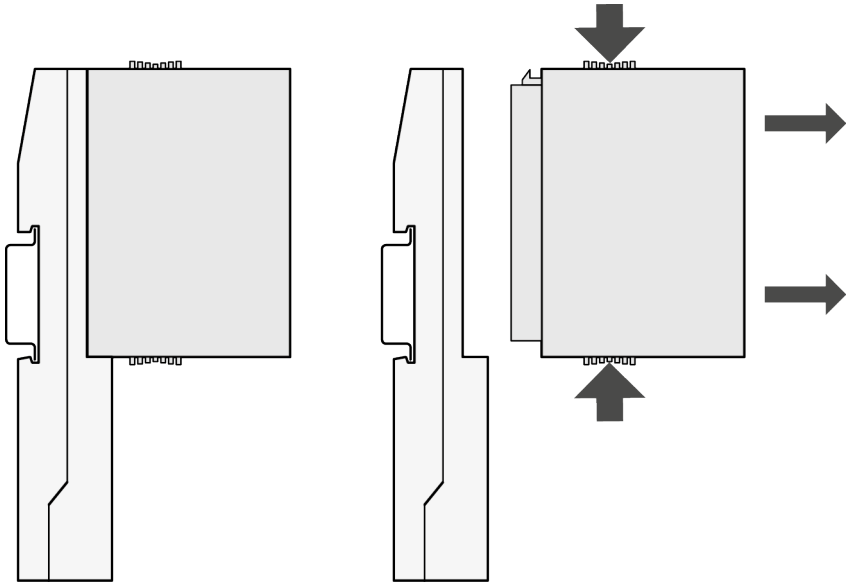
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

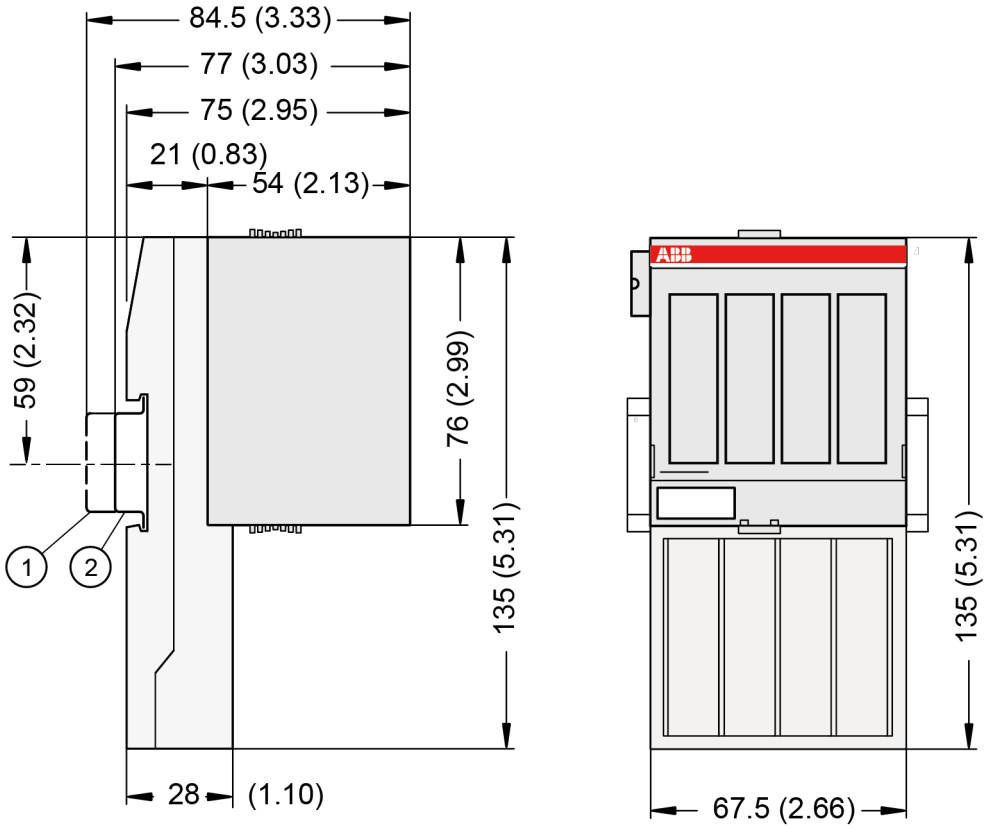
15.1 Assembly



15.2 Disassembly



15.3 Dimensions

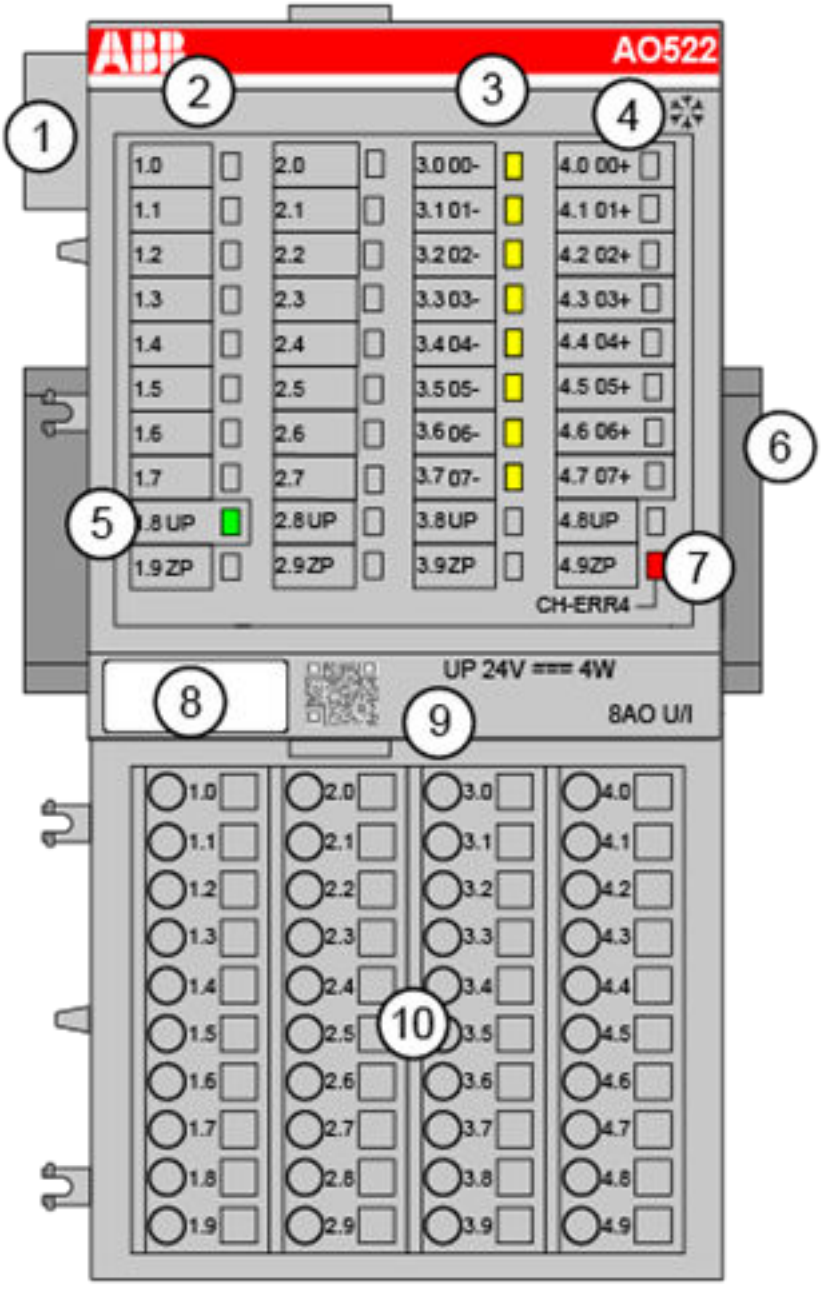


1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

15.4 Connections

- 8 channels configurable for voltage and current
- Resolution: 16 bit including sign
- Analog output signal ranges:
  - -10 V ... +10 V
  - 0 mA ... 20 mA
  - 4 mA ... 20 mA
- Module-wise galvanically isolated
- XC version available for use in extreme ambient conditions



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states at the analog outputs (O0 ... O7)
4 ❄ Sign for XC version
5 1 green LED to display the state of the process supply voltage UP
6 DIN rail
7 1 red LED to display errors

8 Label
9 QR code for ABB access
10 Terminal unit

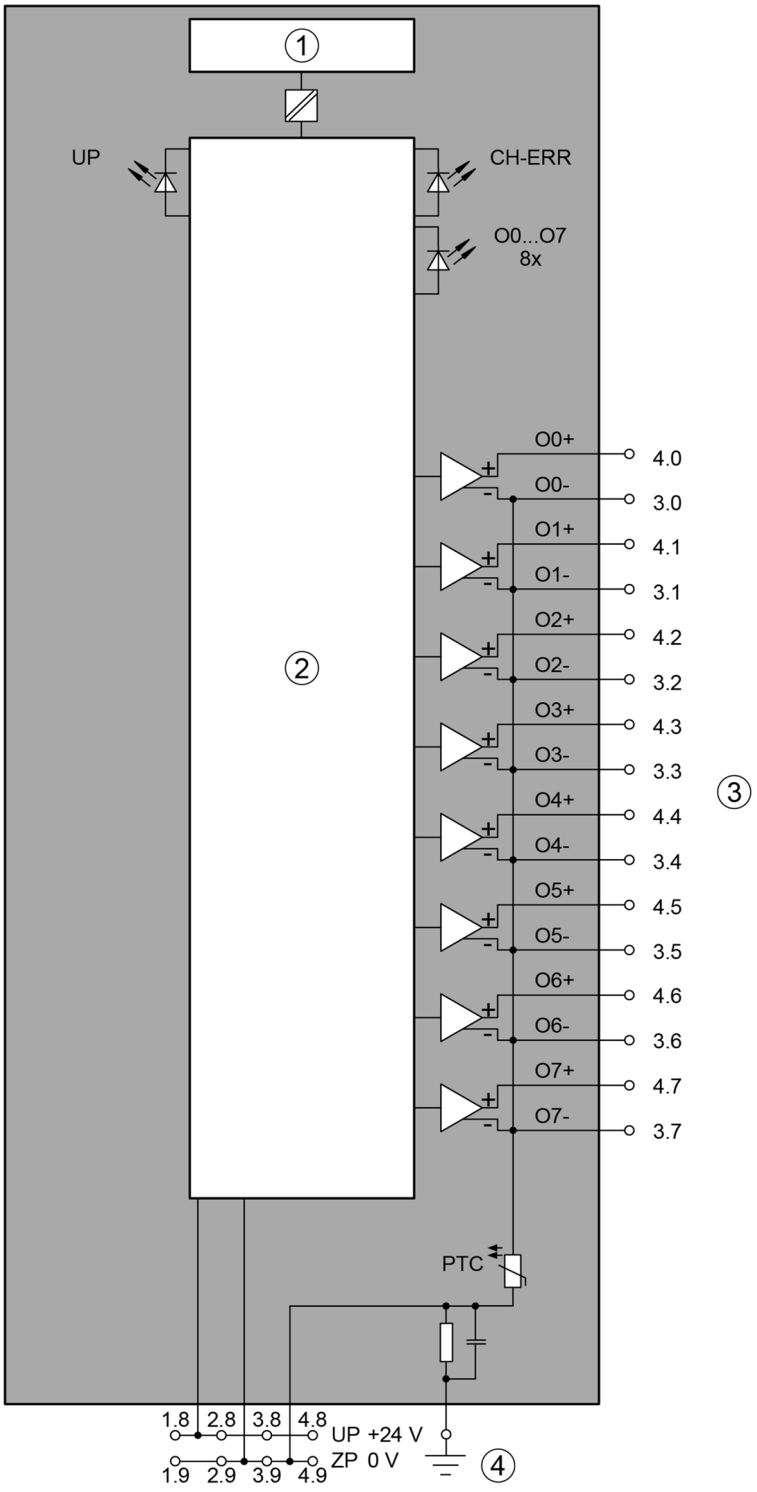
Consider the safety instructions

In the description, special attention must be paid to designs using galvanic isolation, grounding and EMC measures for the reasons stated. Consider the safety instructions for AC500 product family.

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

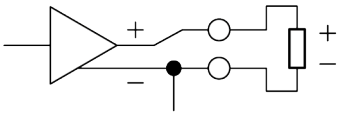
15.4.1 Outputs

Block diagram and connections



1 I/O-bus interface to the CPU or communication interface module
2 Internal logic and I/O circuits of the module
3 Analog outputs
4 Functional earth connection between terminal unit and DIN-rail

Example



O0 ... O3	O4 ... O7
± 10 V	± 10 V
0 mA ... +20 mA	–
+4 mA ... +20 mA	–

Fig. 20: Example of connection output

16 AO523(-XC)

- AO523
- AO523-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

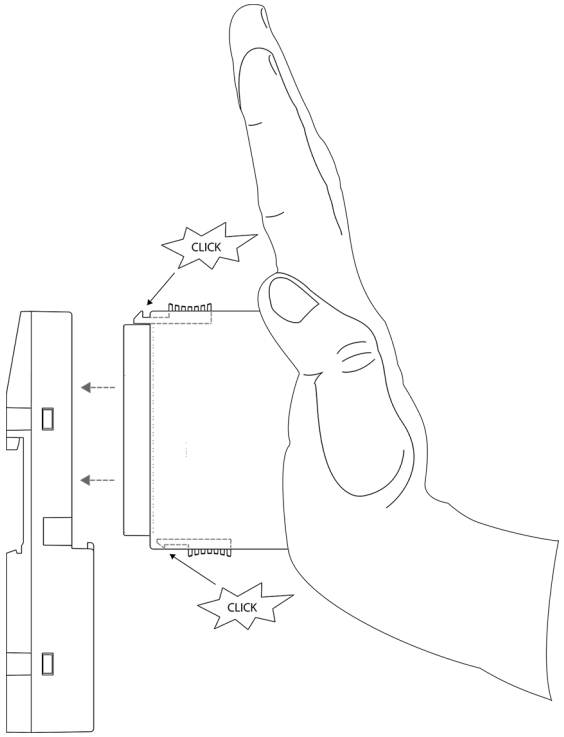
NOTICE!

Hot swap

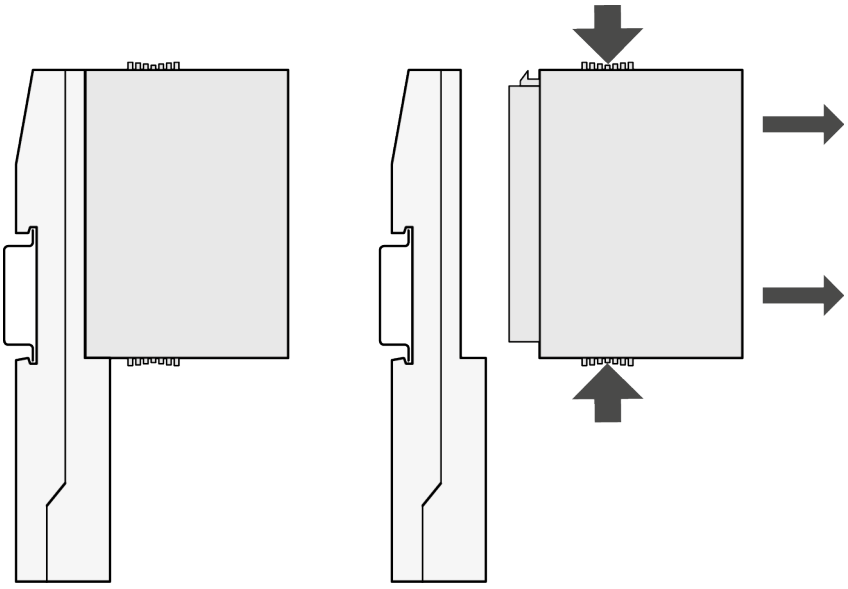
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

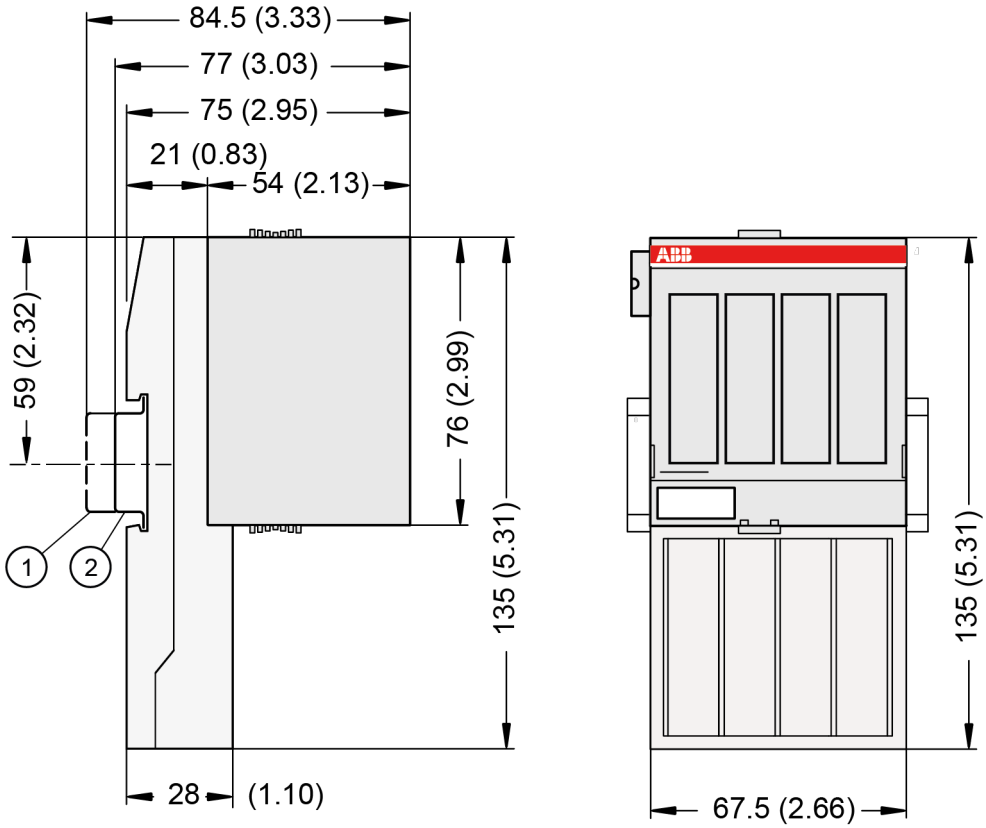
16.1 Assembly



16.2 Disassembly



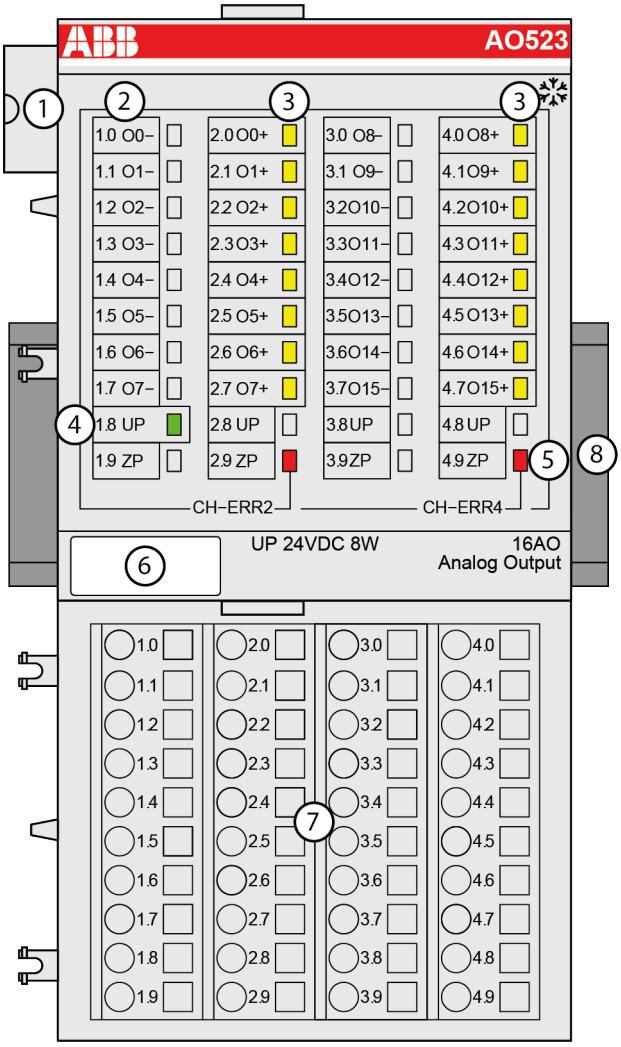
16.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

16.4 Connections



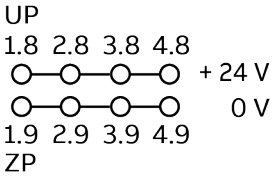
1 I/O bus
2 Allocation between terminal number and signal name
3 Yellow LEDs to display the signal states of the channels
4 1 green LED to display the state of the process supply voltage UP
5 2 red LEDs to display errors
6 Label
7 Terminal unit
8 DIN rail
❄ Sign for XC version

Consider the safety instructions

In the description, special attention must be paid to designs using galvanic isolation, grounding and EMC measures for the reasons stated. Consider the safety instructions for AC500 product family.

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

16.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

16.4.2 Outputs

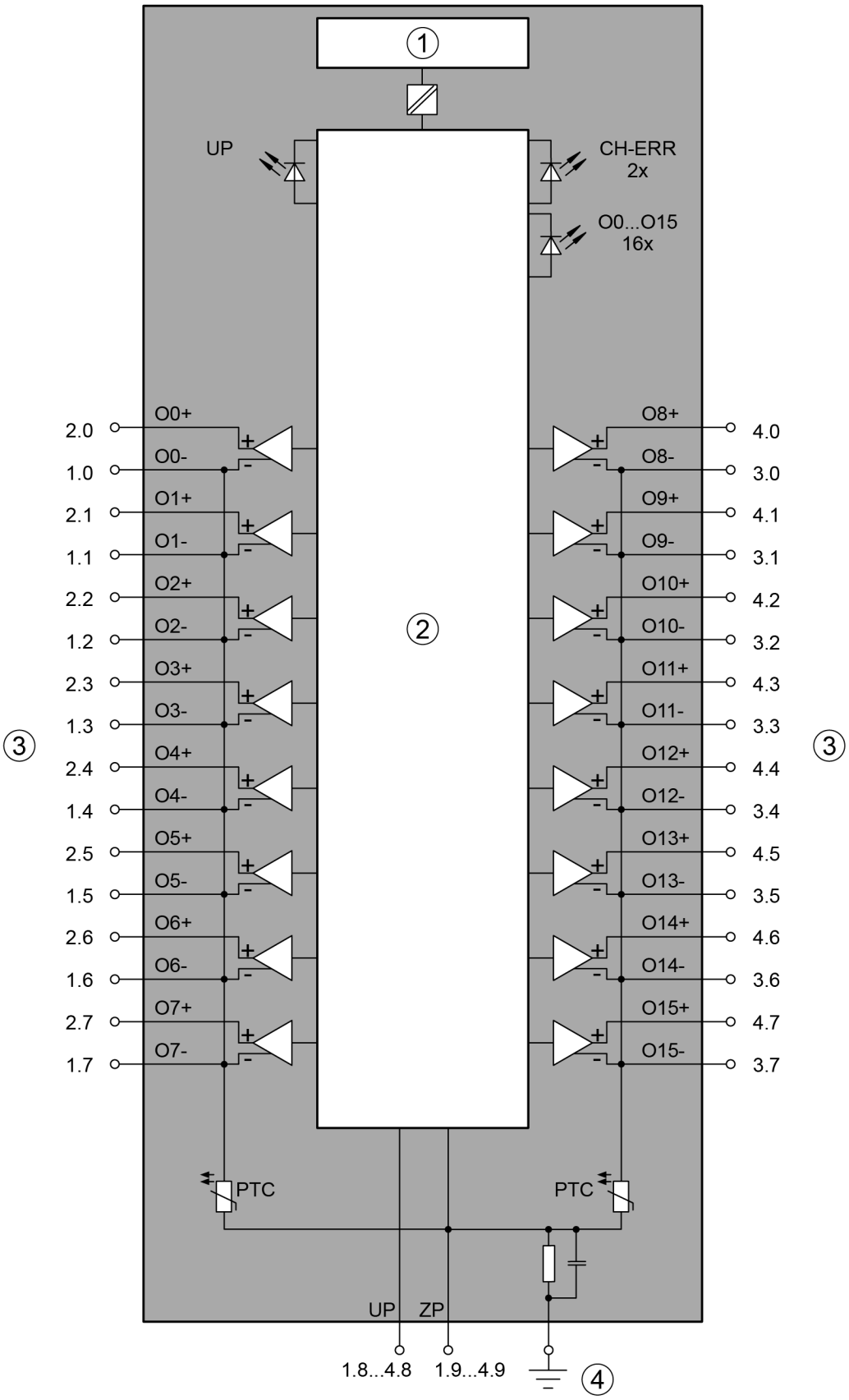
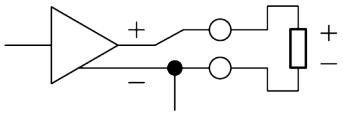


Fig. 21: Connection of the module: 16 analog outputs in two groups

1 I/O bus interface
2 Logic
3 Analog outputs
4 Functional earth connection

Example

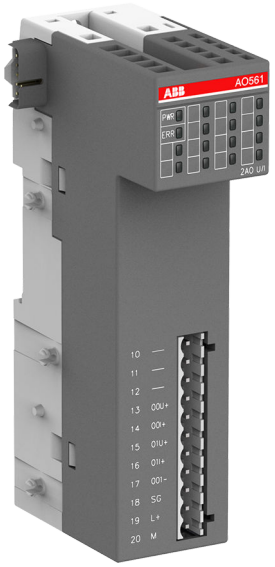


O0 ... O3	O4 ... O7
O8 ... O11	O12 ... O15
± 10 V	± 10 V
0 mA ... +20 mA	–
+4 mA ... +20 mA	–

Fig. 22: Example of connection output

17 AO561

- AO561



CAUTION!

Risk of injury and damaging the product!

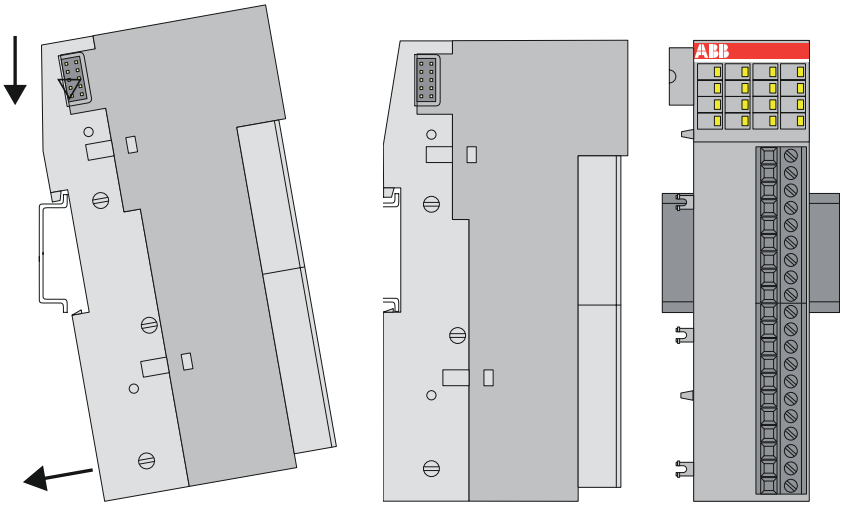
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

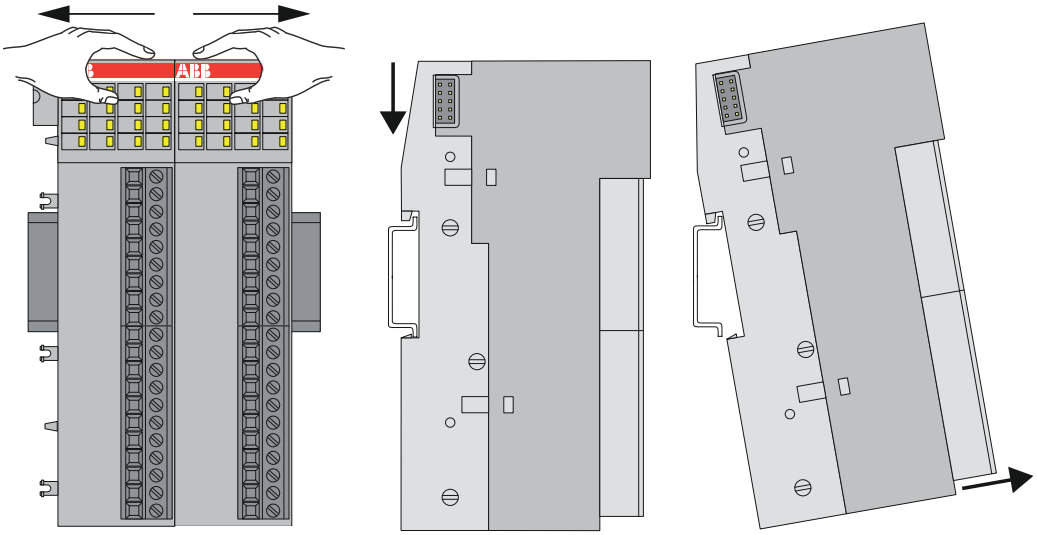
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

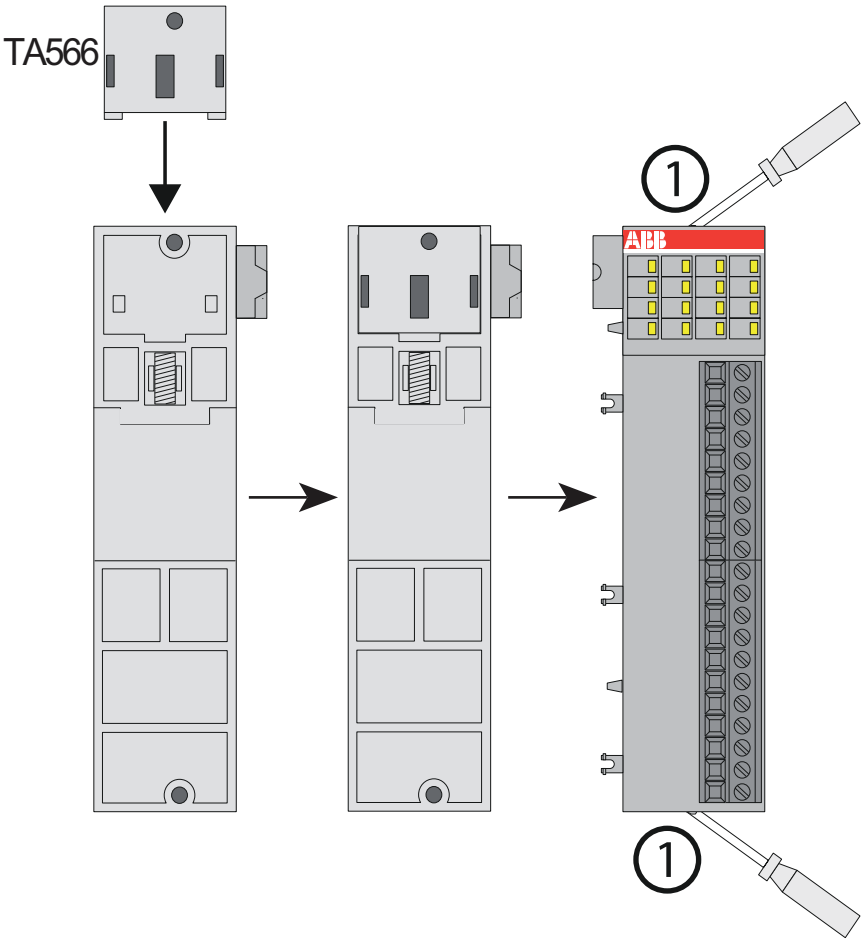
17.1 Assembly



17.2 Disassembly



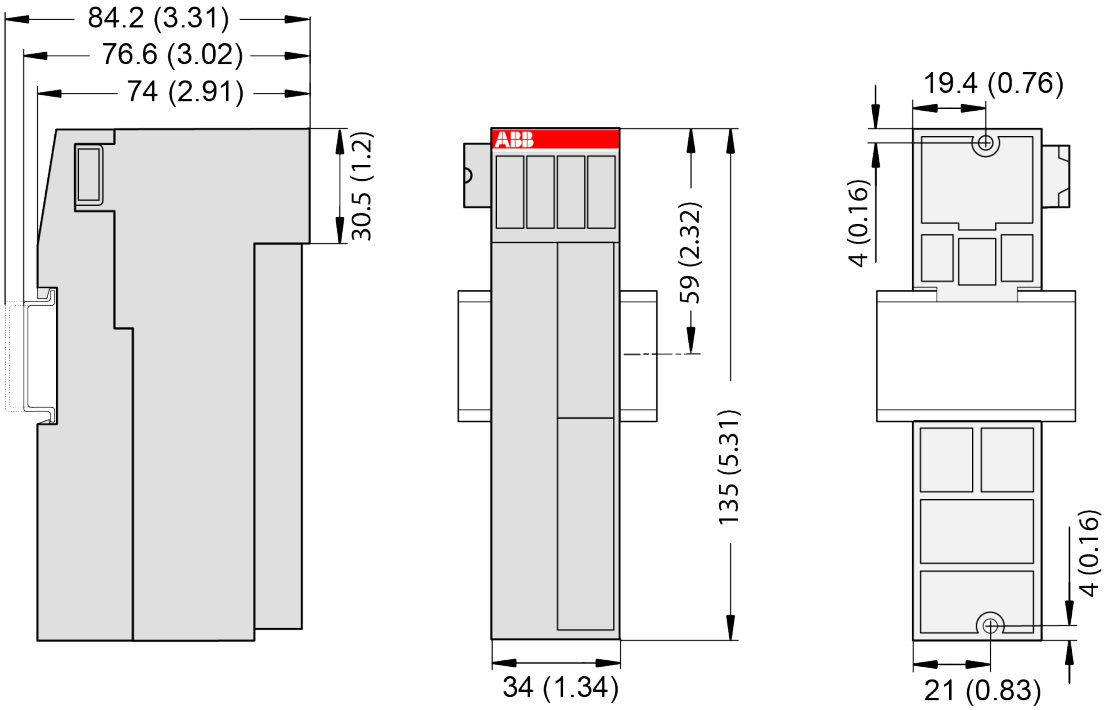
17.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

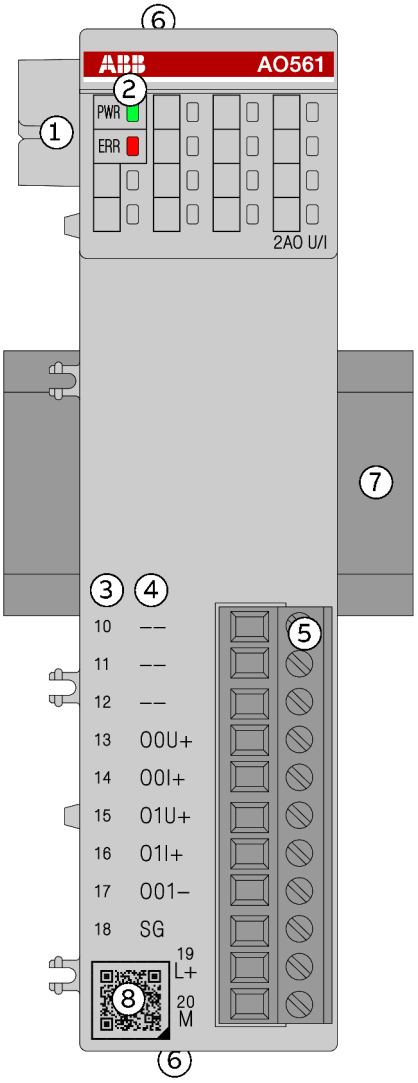
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

17.4 Dimensions



The dimensions are in mm and in brackets in inch.

17.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (11-pin)
6 2 holes for wall-mounting with screws
7 DIN rail
8 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-11	11-pin, screw, cable from front
	TA564-11	11-pin, screw, cable from side
	TA565-11	11-pin, spring, cable from front

17.5.1 Outputs

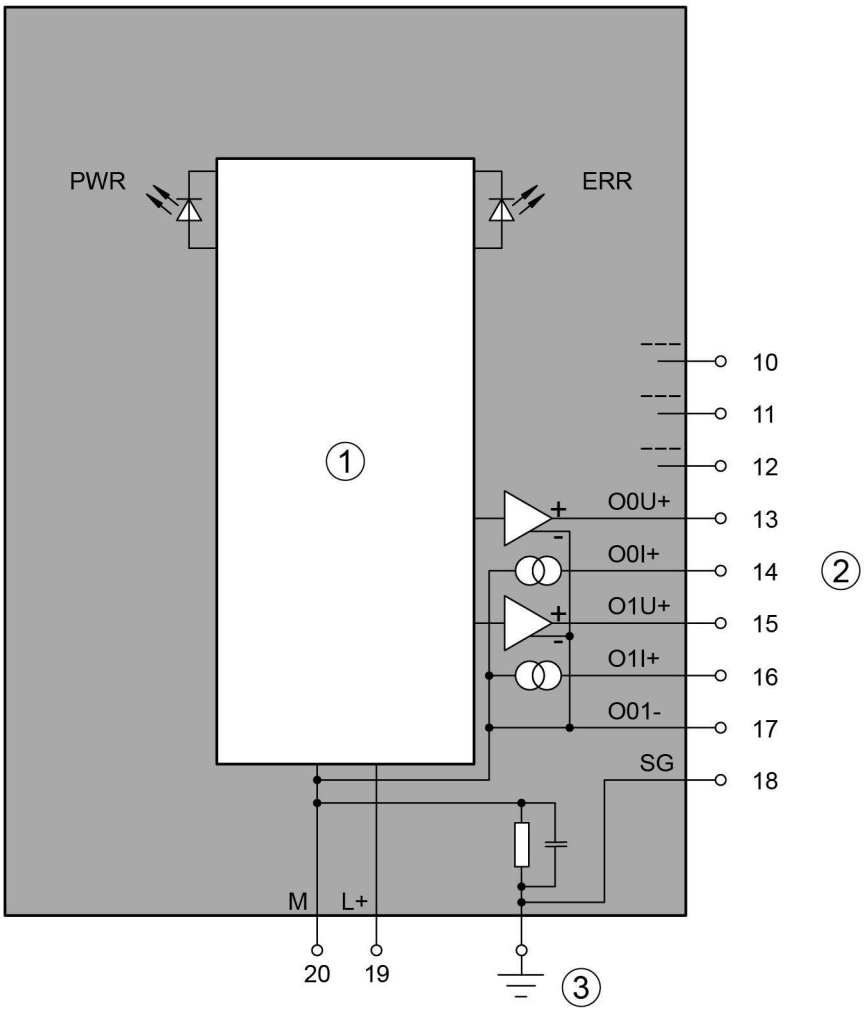
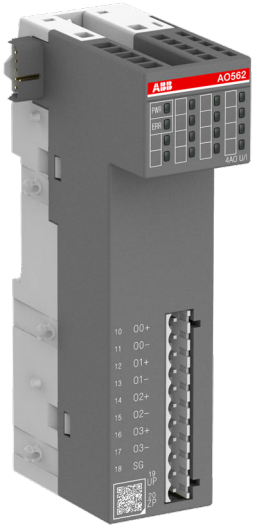


Fig. 23: Internal construction of the analog outputs

1 Logic - I/O bus inteface
2 Analog outputs
3 Functional earth connection

18 AO562

- AO562



CAUTION!

Risk of injury and damaging the product!

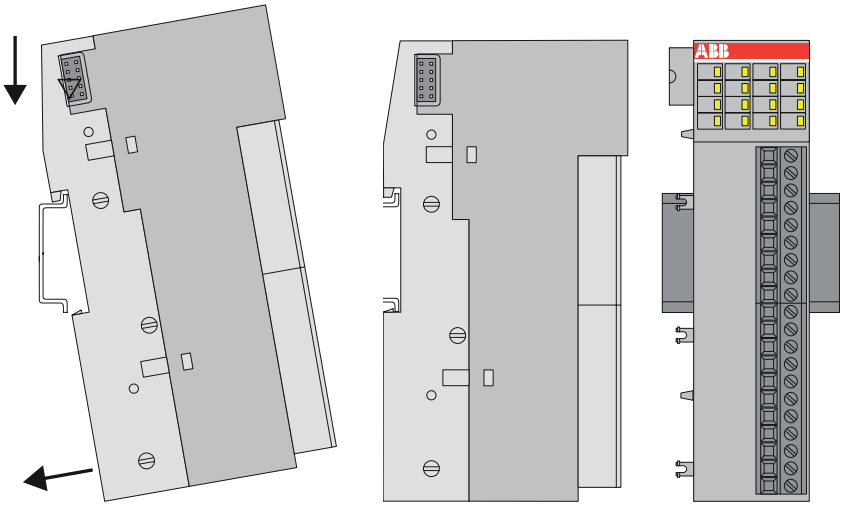
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

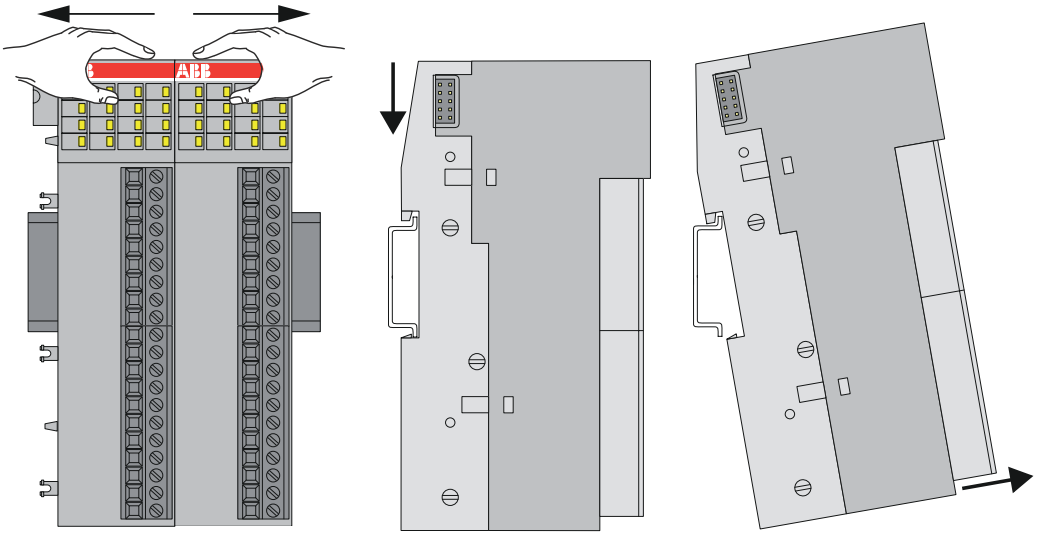
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

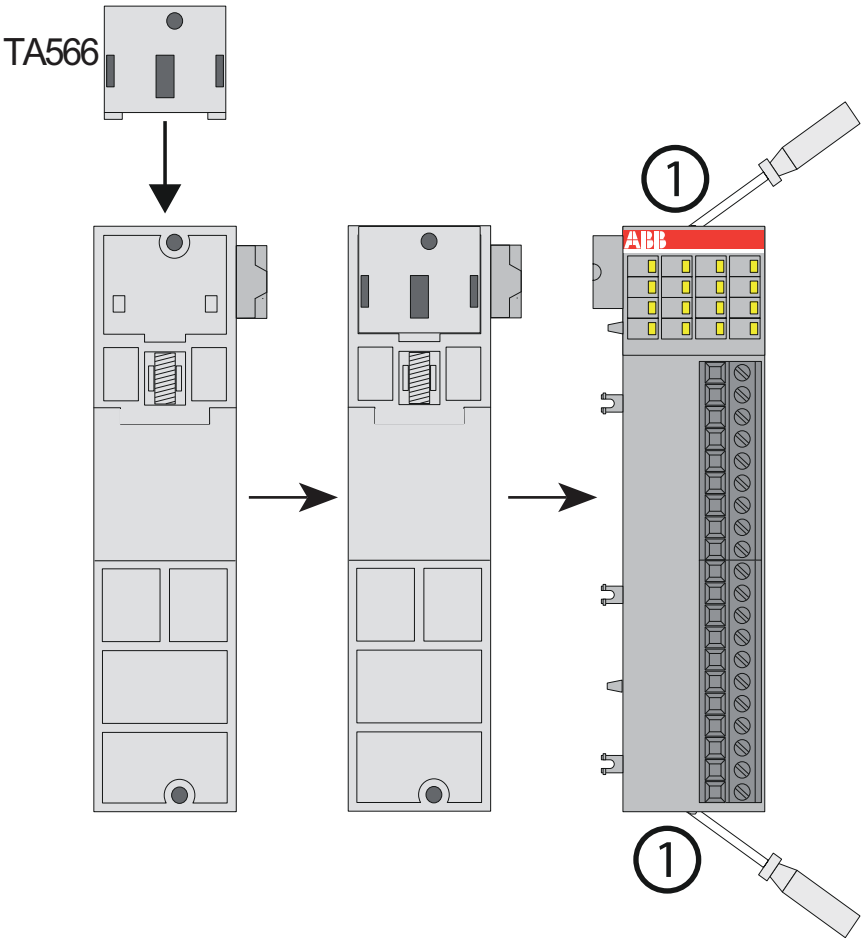
18.1 Assembly



18.2 Disassembly



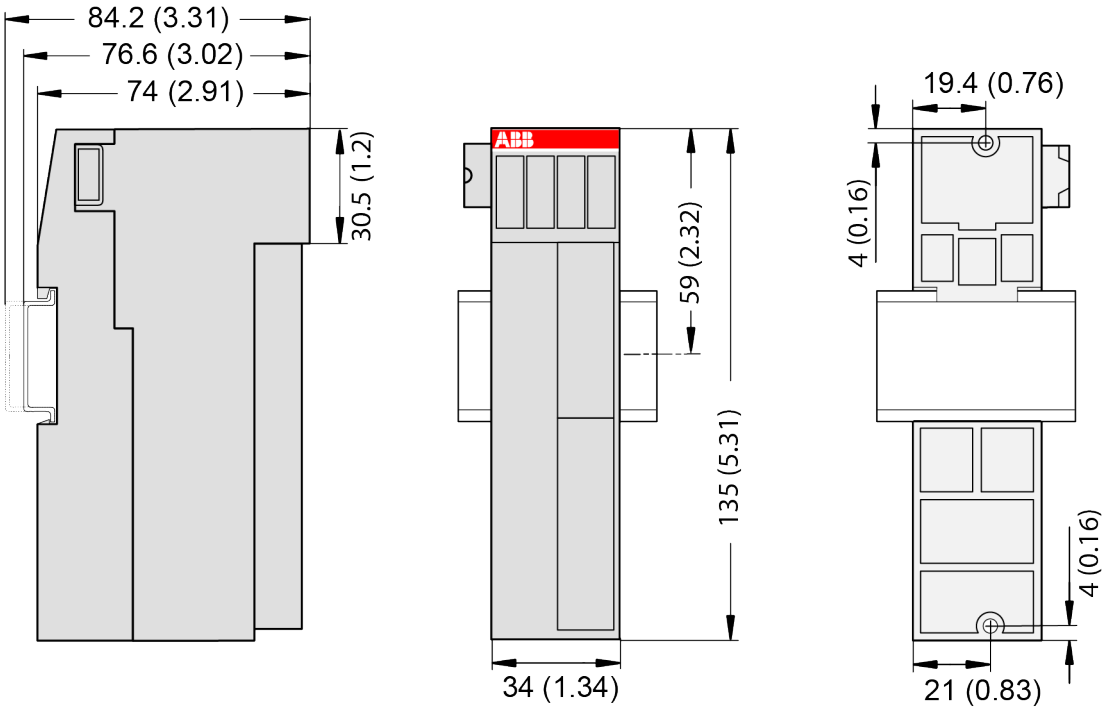
18.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

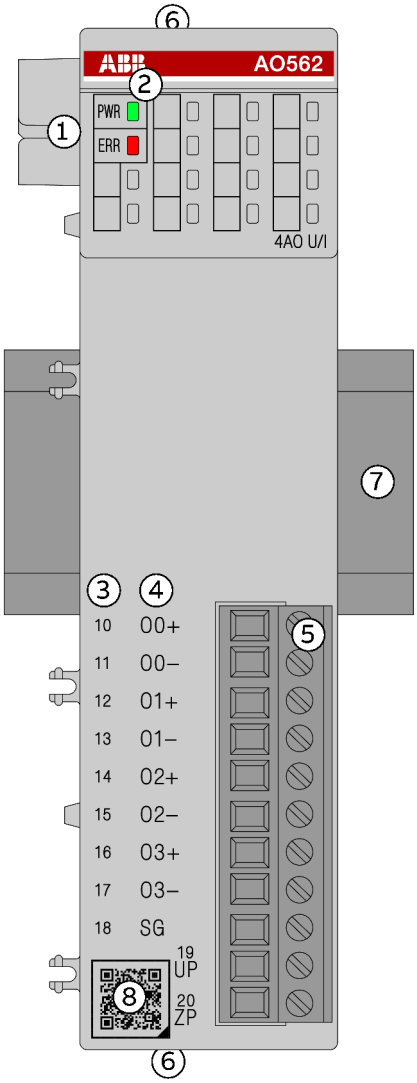
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

18.4 Dimensions



The dimensions are in mm and in brackets in inch.

18.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (11-pin)
6 2 holes for wall-mounting with screws
7 DIN rail
8 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-11	11-pin, screw, cable from front
	TA564-11	11-pin, screw, cable from side
	TA565-11	11-pin, spring, cable from front

18.5.1 Outputs

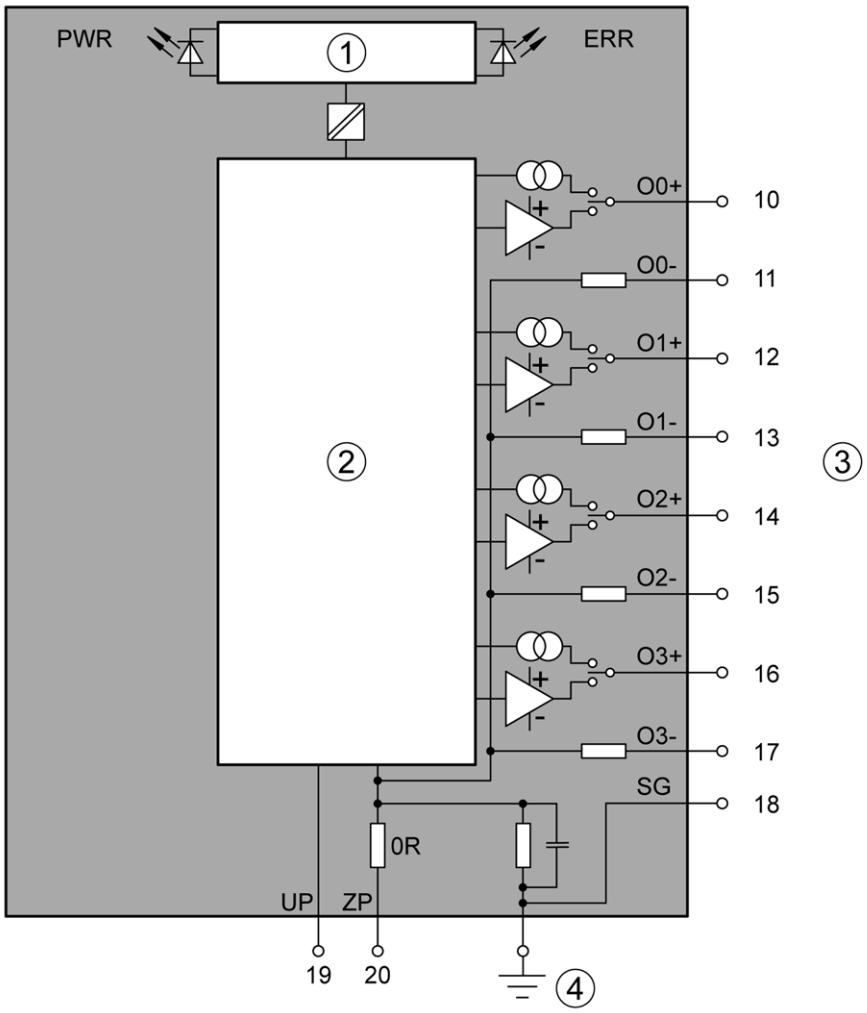
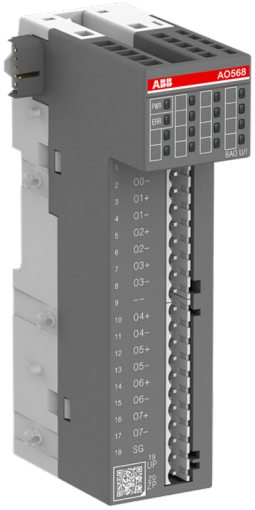


Fig. 24: Internal construction of the analog outputs

1 I/O bus interface and MCU core circuit
2 DAC, logic circuit and DC/DC power
3 Analog outputs
4 Functional earth connection

19 AO568

- AO568



CAUTION!

Risk of injury and damaging the product!

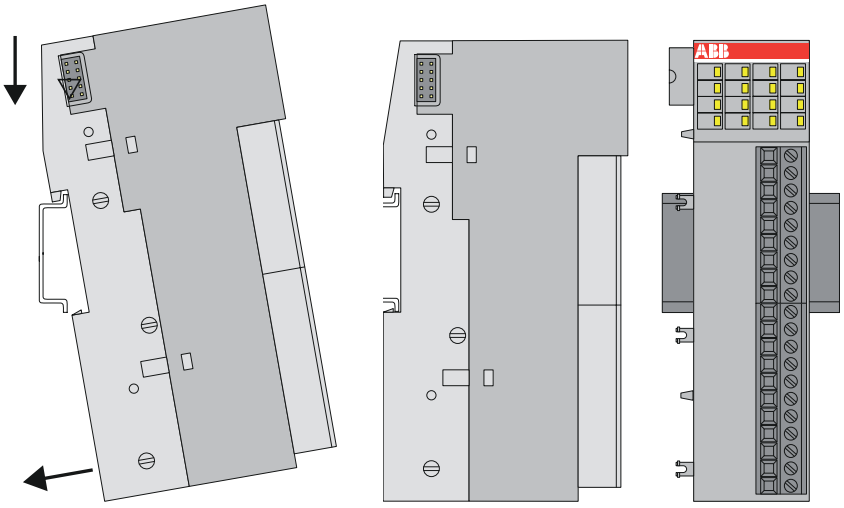
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- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

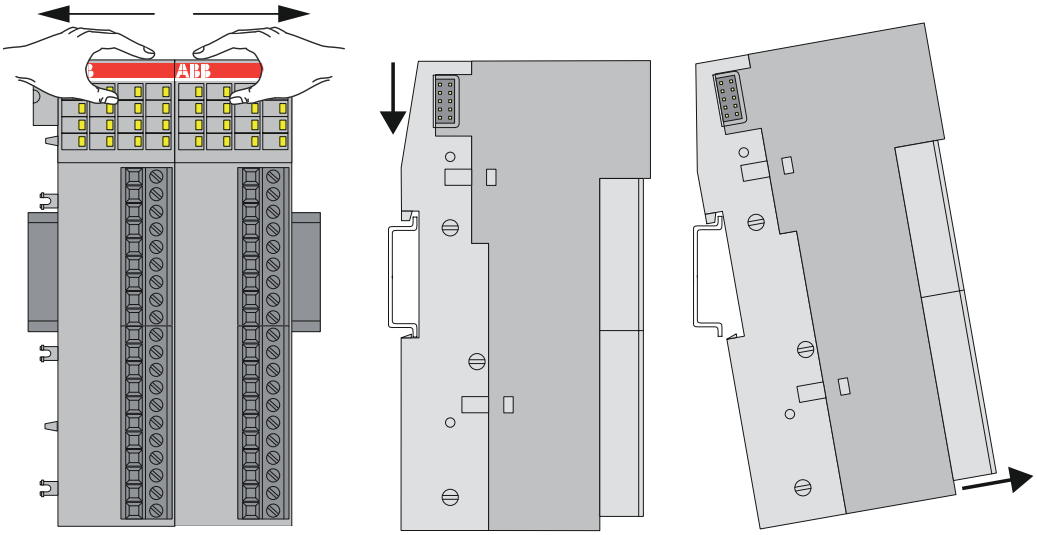
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

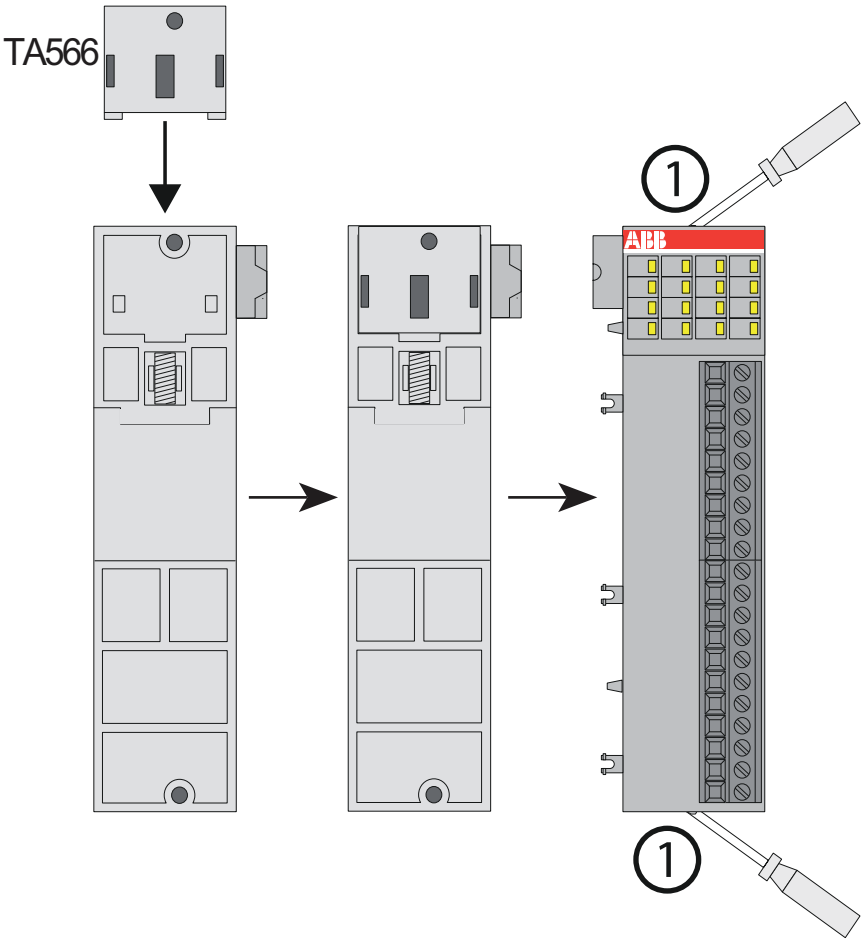
19.1 Assembly



19.2 Disassembly



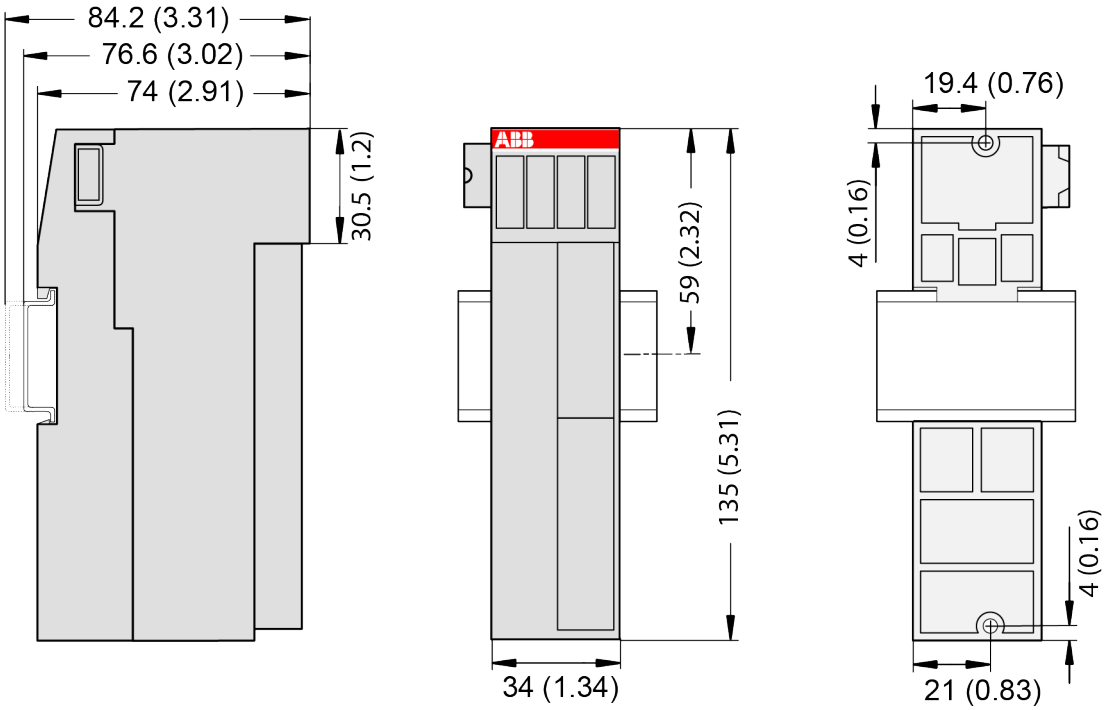
19.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

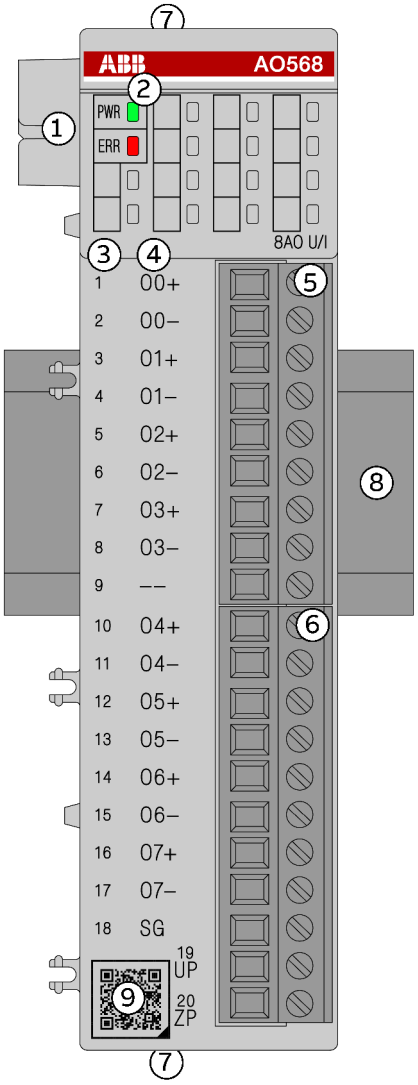
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

19.4 Dimensions



The dimensions are in mm and in brackets in inch.

19.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (9-pin)
6 Terminal block for output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for data sheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

19.5.1 Outputs

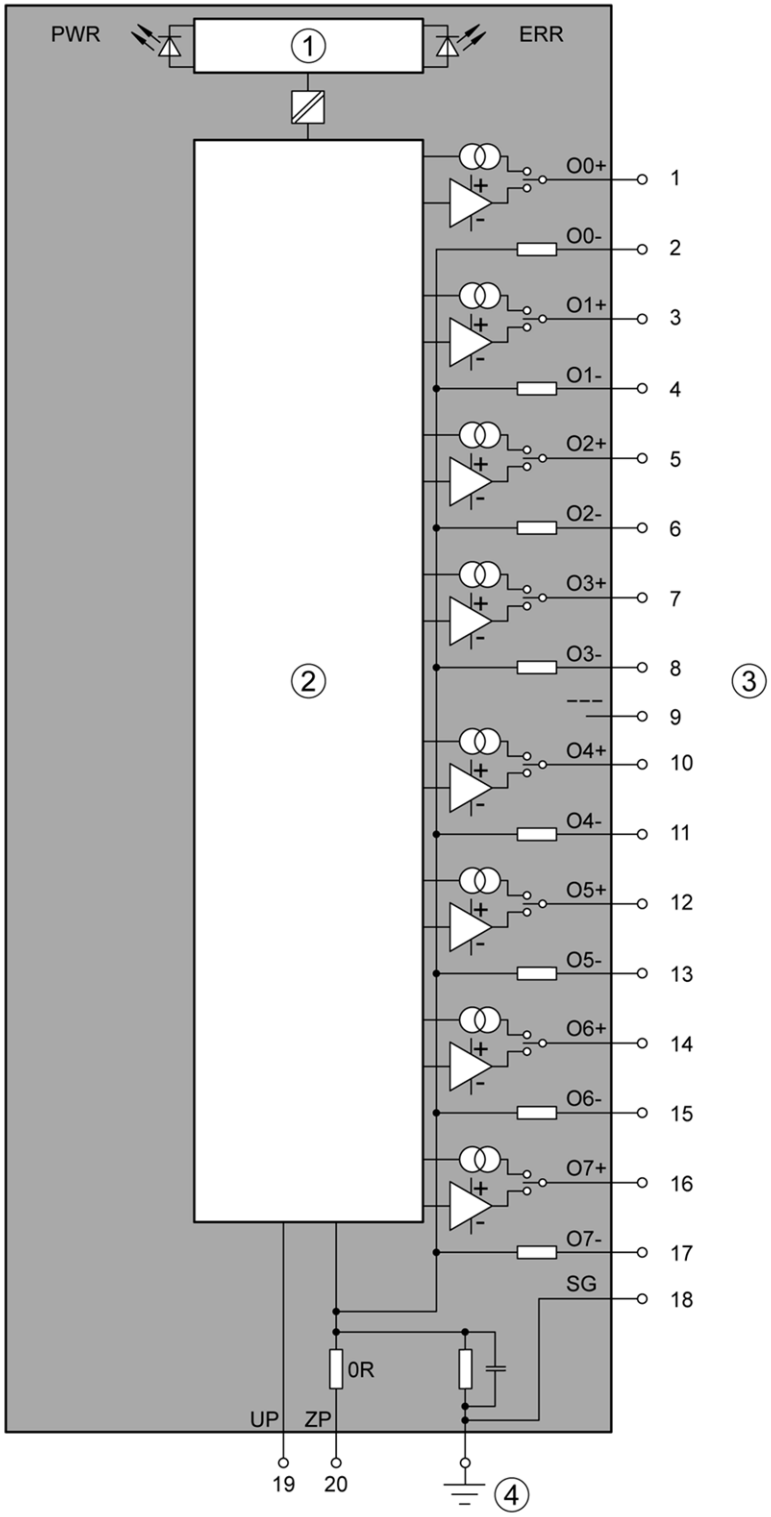


Fig. 25: Internal construction of the analog outputs

1 I/O bus interface and MCU core circuit
2 DAC, logic circuit and DC/DC power
3 Analog outputs
4 Functional earth connection

20 AX521(-XC)

- AX521
- AX521-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

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– Only by qualified personnel.

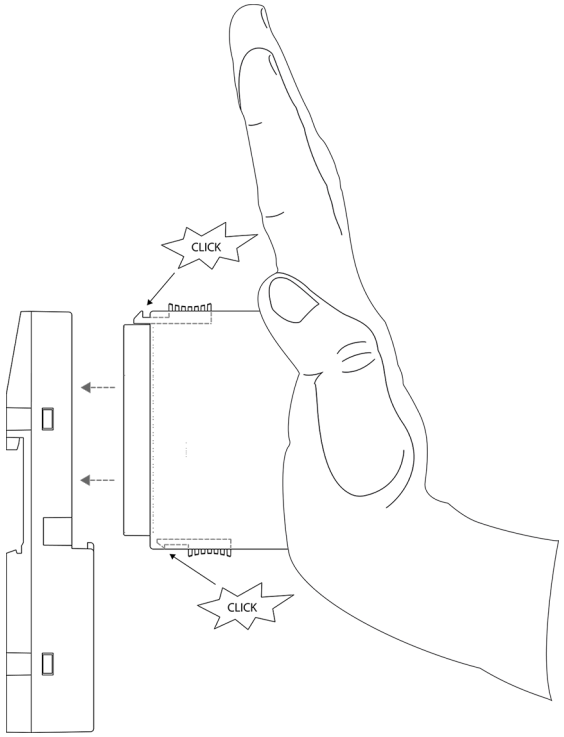
NOTICE!

Hot swap

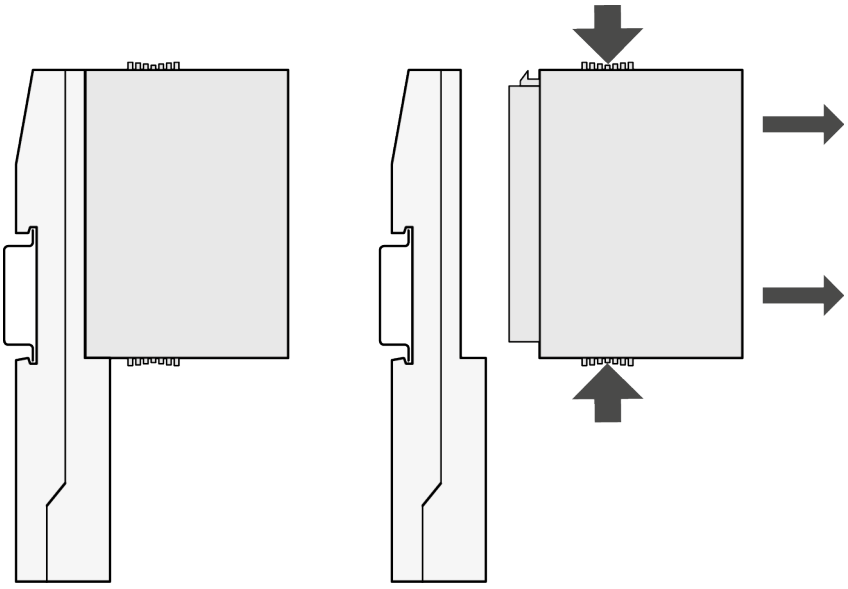
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

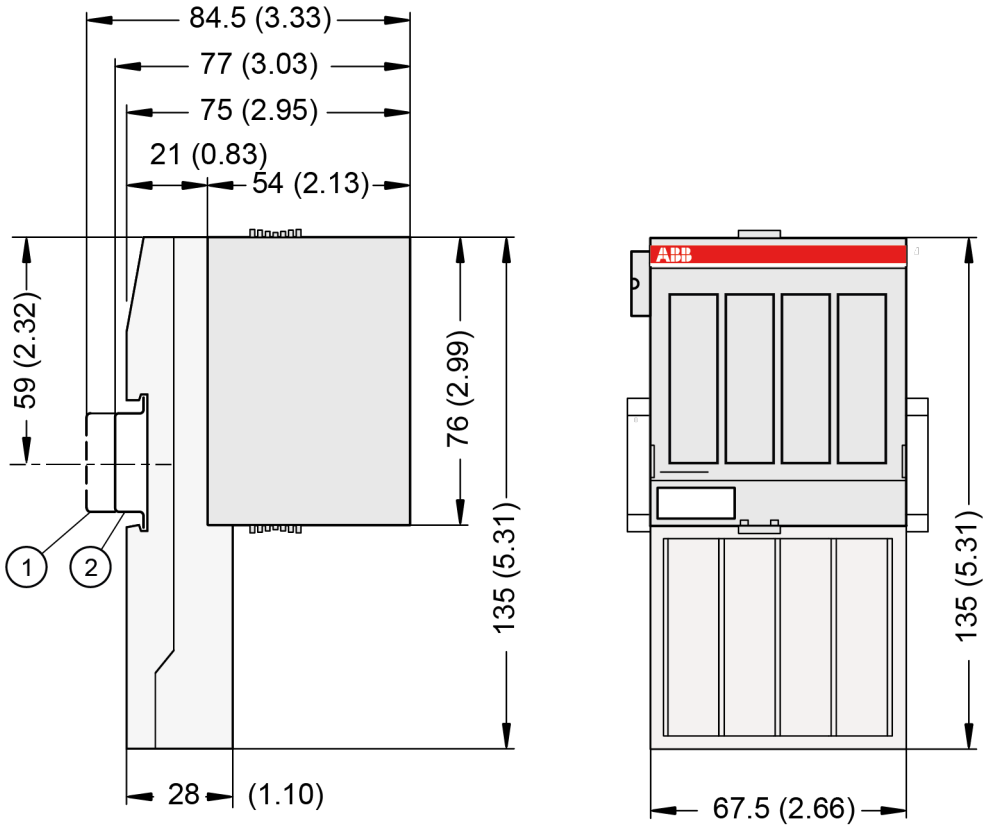
20.1 Assembly



20.2 Disassembly



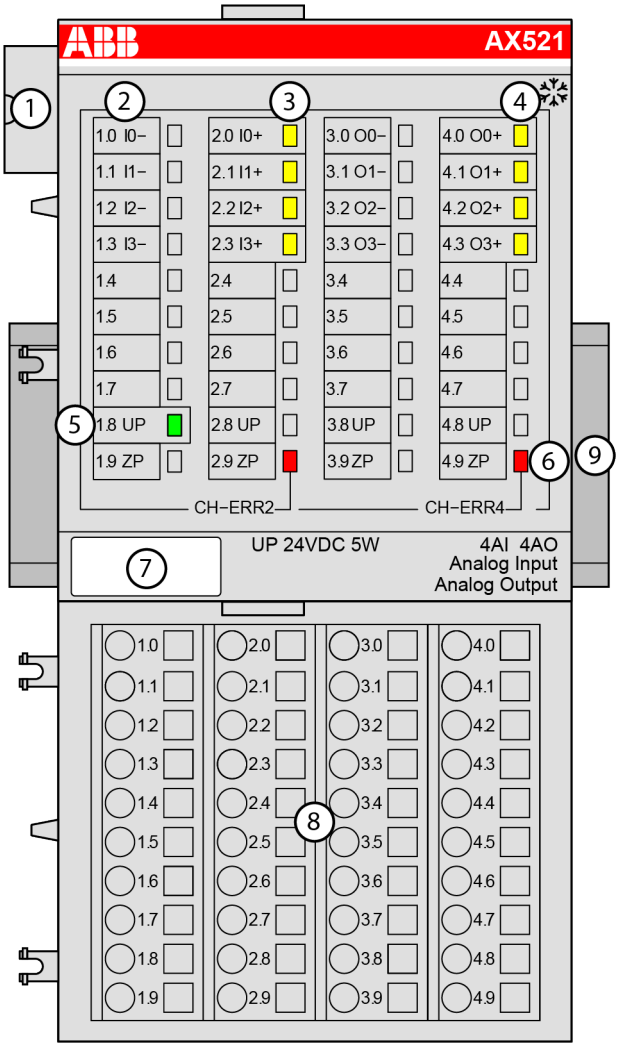
20.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

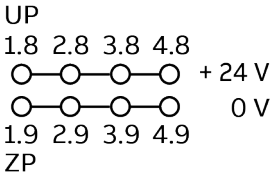
20.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 4 yellow LEDs to display the signal states at the analog inputs (I0 ... I3)
4 4 yellow LEDs to display the signal states at the analog outputs (O0 ... O3)
5 1 green LED to display the state of the process supply voltage UP
6 2 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

20.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

20.4.2 Inputs/Outputs

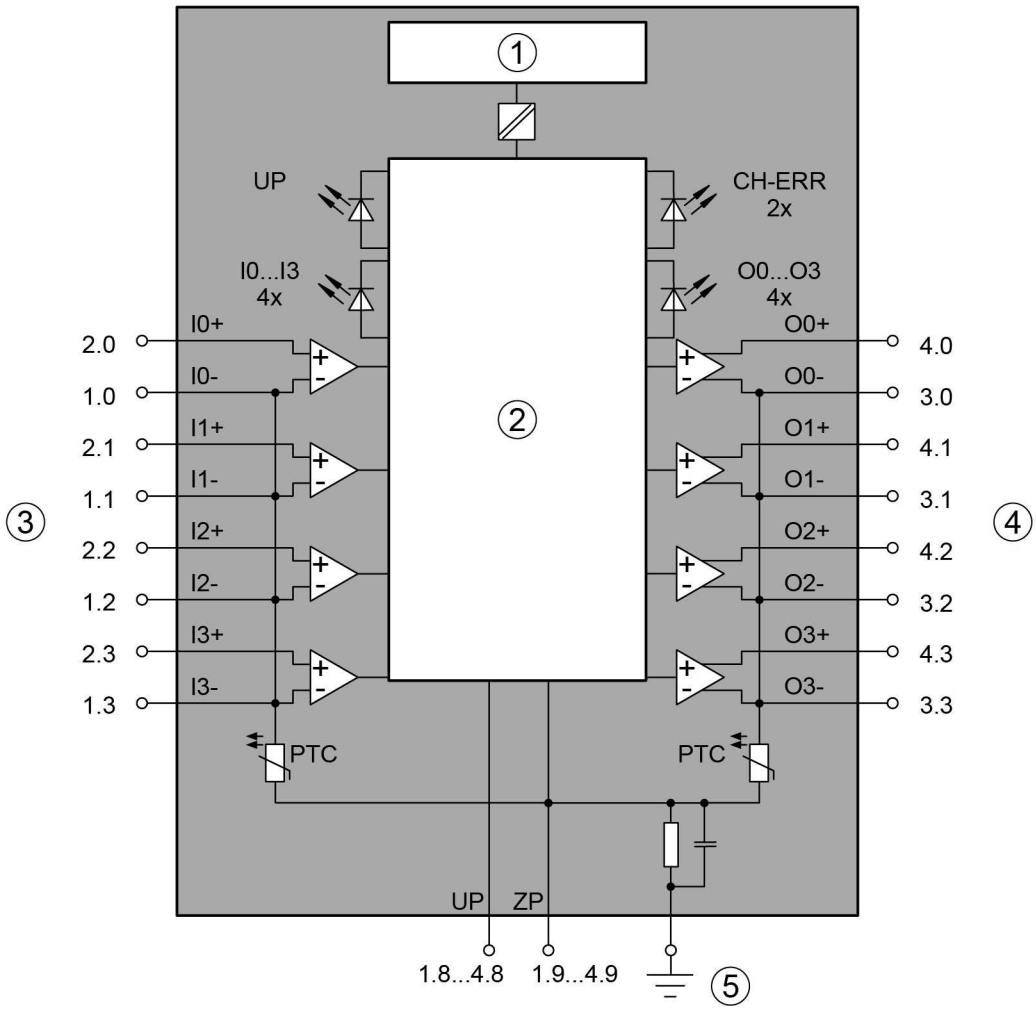
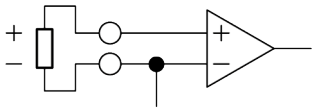


Fig. 26: Connection of the I/O module: 4 analog inputs and 4 analog outputs, individually configurable

1 I/O bus interface
2 Logic
3 Analog inputs
4 Analog outputs
5 Functional earth connection

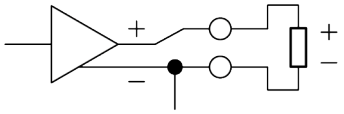
Example



I0 ... I3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 27: Example of connection input

Example



O0 ... O3
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 28: Example of connection output

21 AX522(-XC)

- AX522
- AX522-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

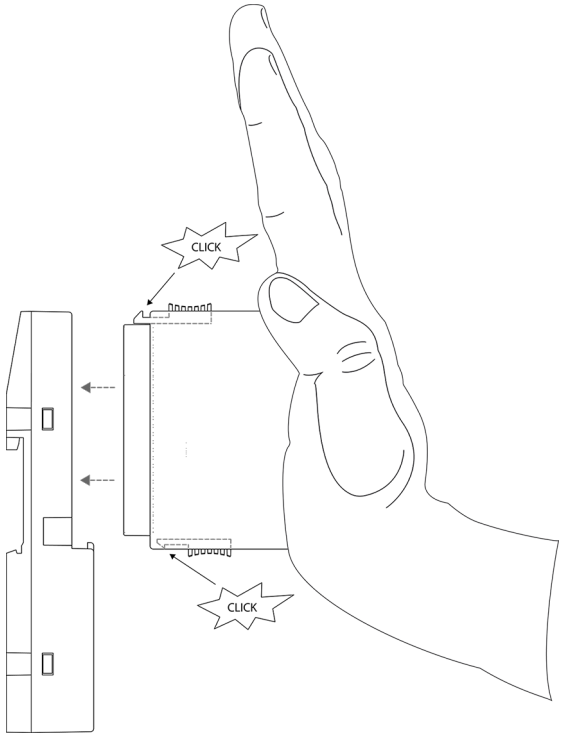
NOTICE!

Hot swap

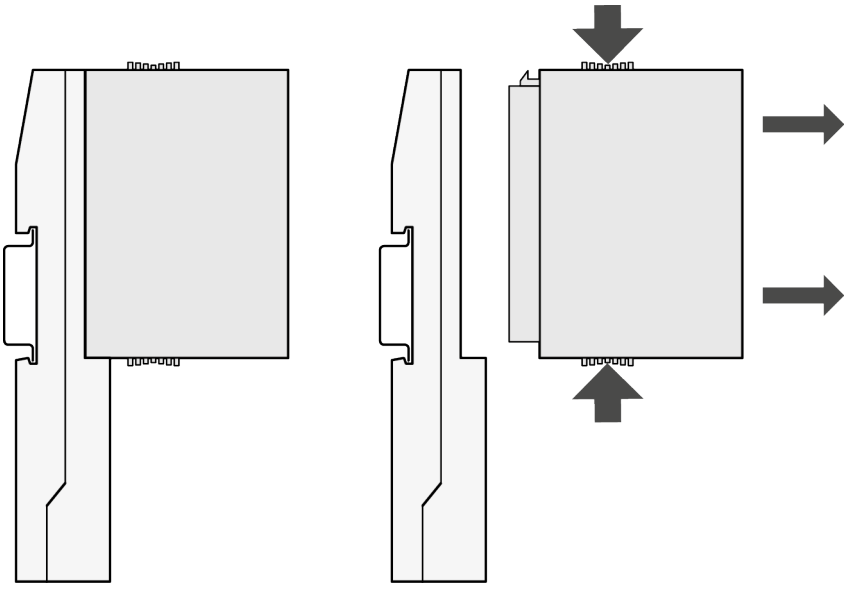
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

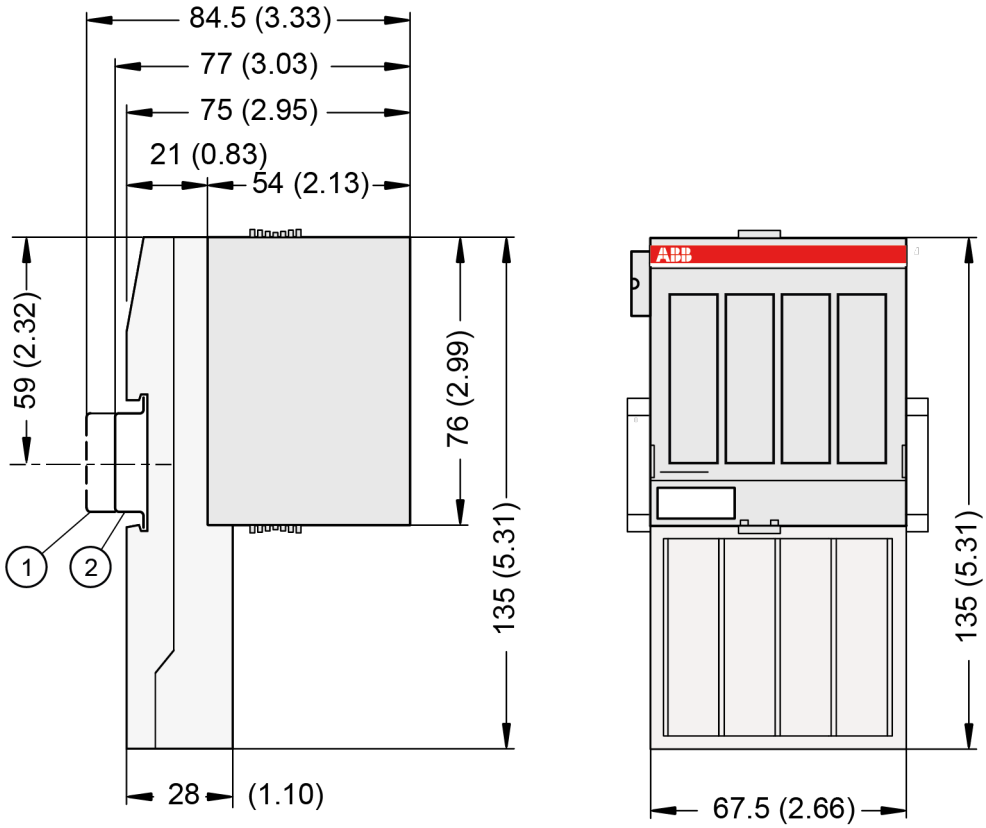
21.1 Assembly



21.2 Disassembly



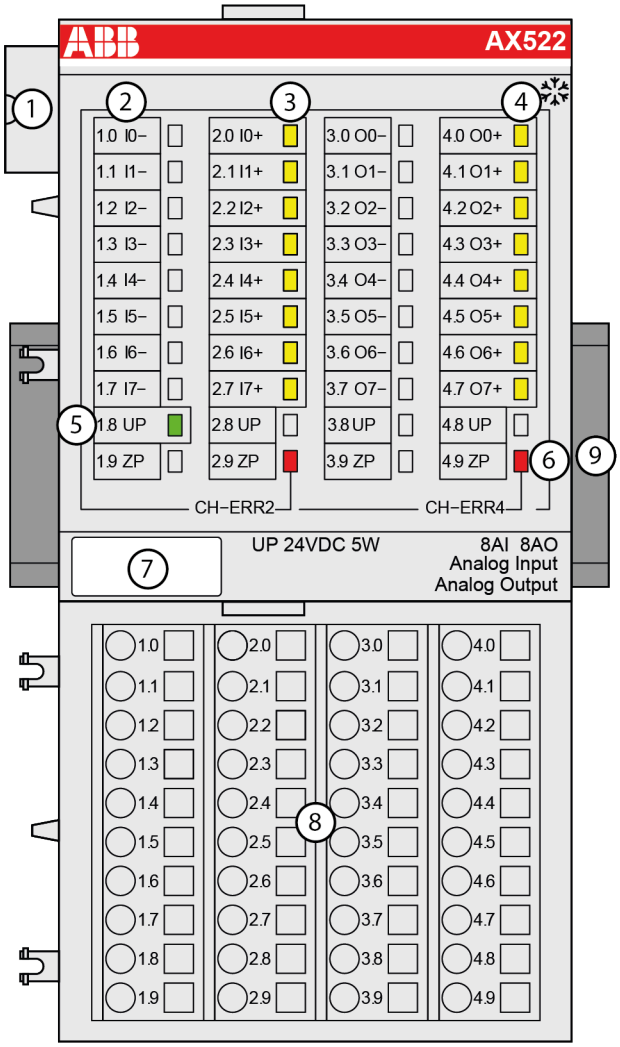
21.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

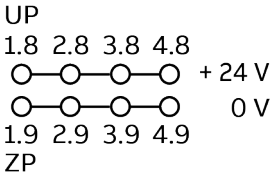
21.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states at the analog inputs (I0 ... I7)
4 8 yellow LEDs to display the signal states at the analog outputs (O0 ... O7)
5 1 green LED to display the state of the process supply voltage UP
6 2 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

21.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

21.4.2 Inputs/Outputs

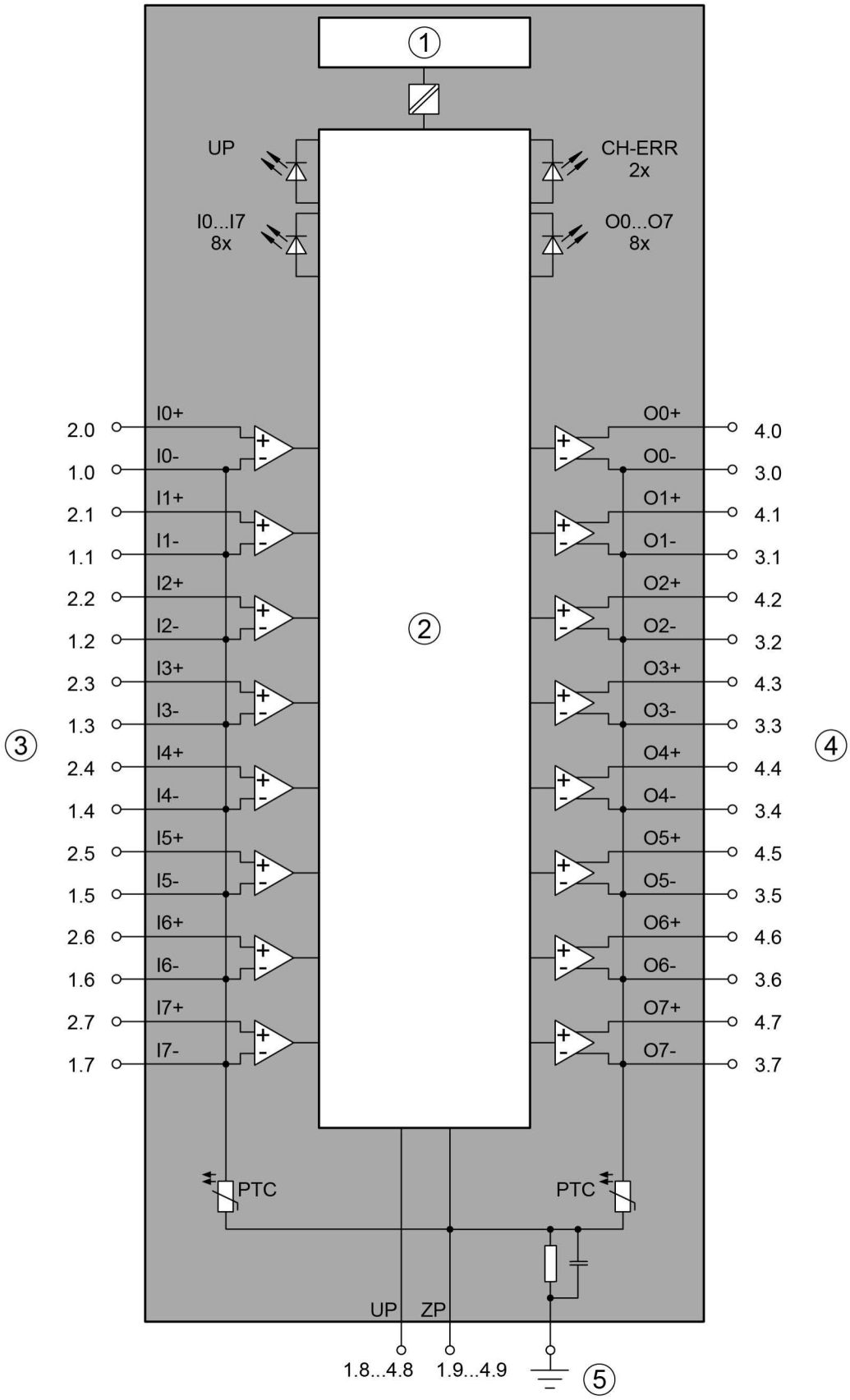
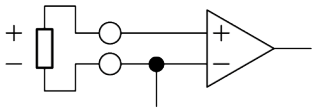


Fig. 29: Connection of the I/O module: 8 analog inputs and 8 analog outputs, individually configurable

1 I/O bus interface
2 Logic
3 Analog inputs
4 Analog outputs
5 Functional earth connection

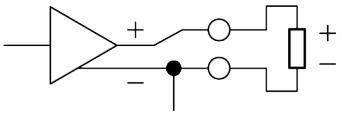
Example



I0 ... I7
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 30: Example of connection input

Example

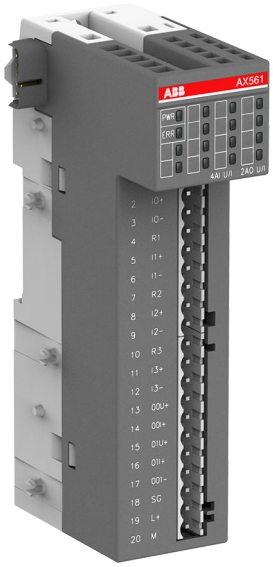


O0 ... O3	O4 ... O7
± 10 V	± 10 V
0 mA ... +20 mA	–
+4 mA ... +20 mA	–

Fig. 31: Example of connection output

22 AX561

- AX561



CAUTION!

Risk of injury and damaging the product!

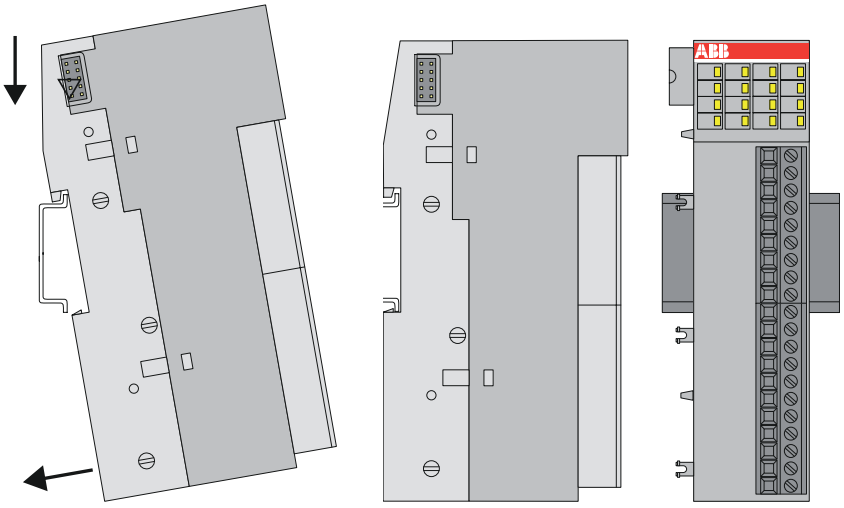
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

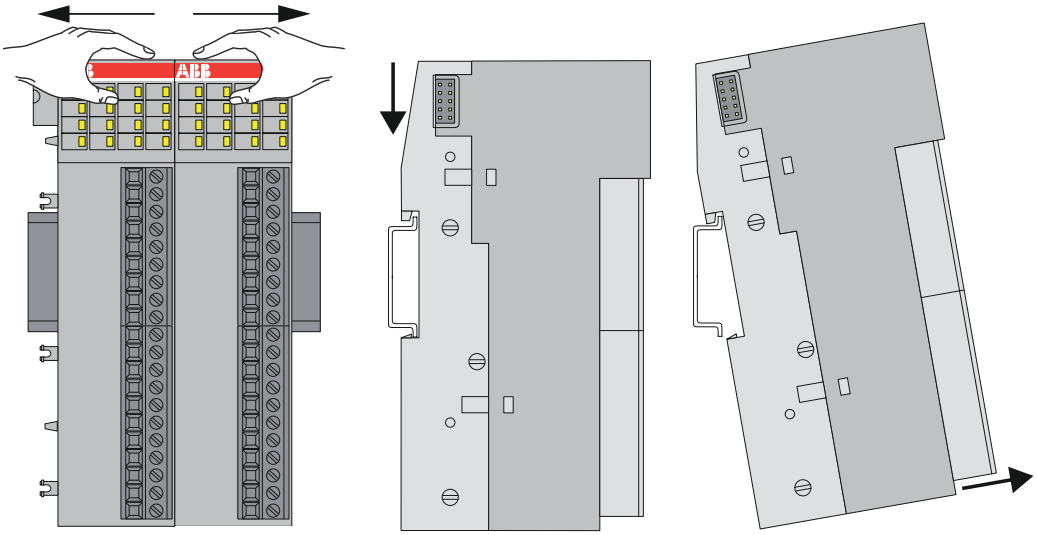
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

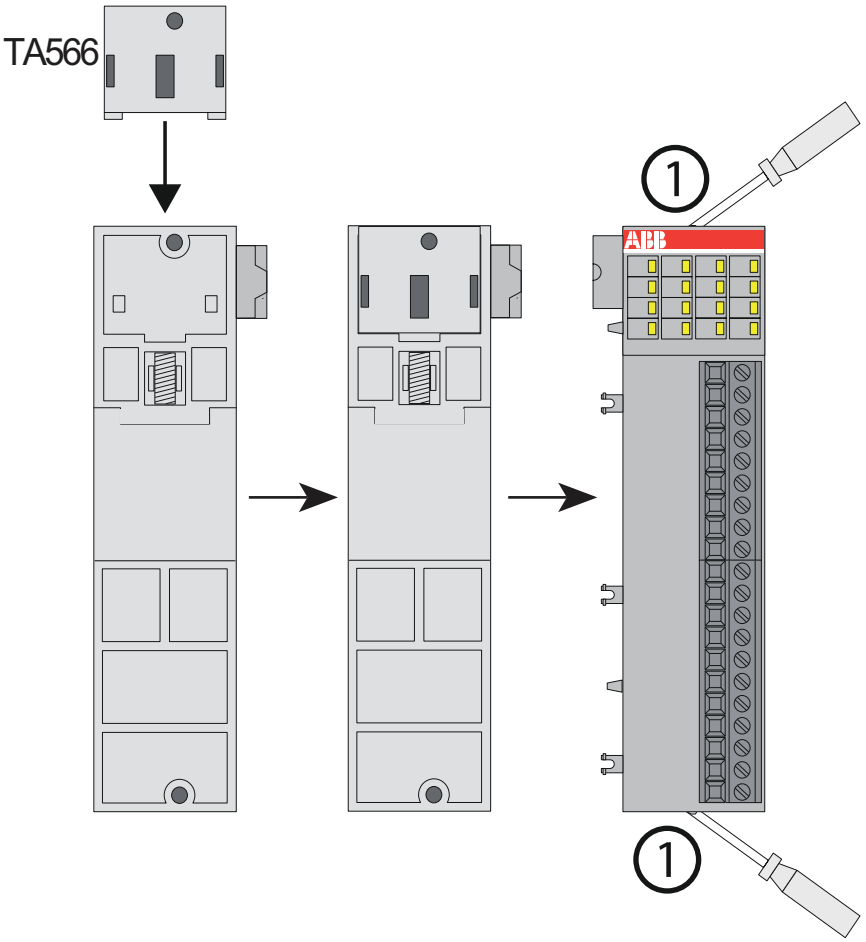
22.1 Assembly



22.2 Disassembly



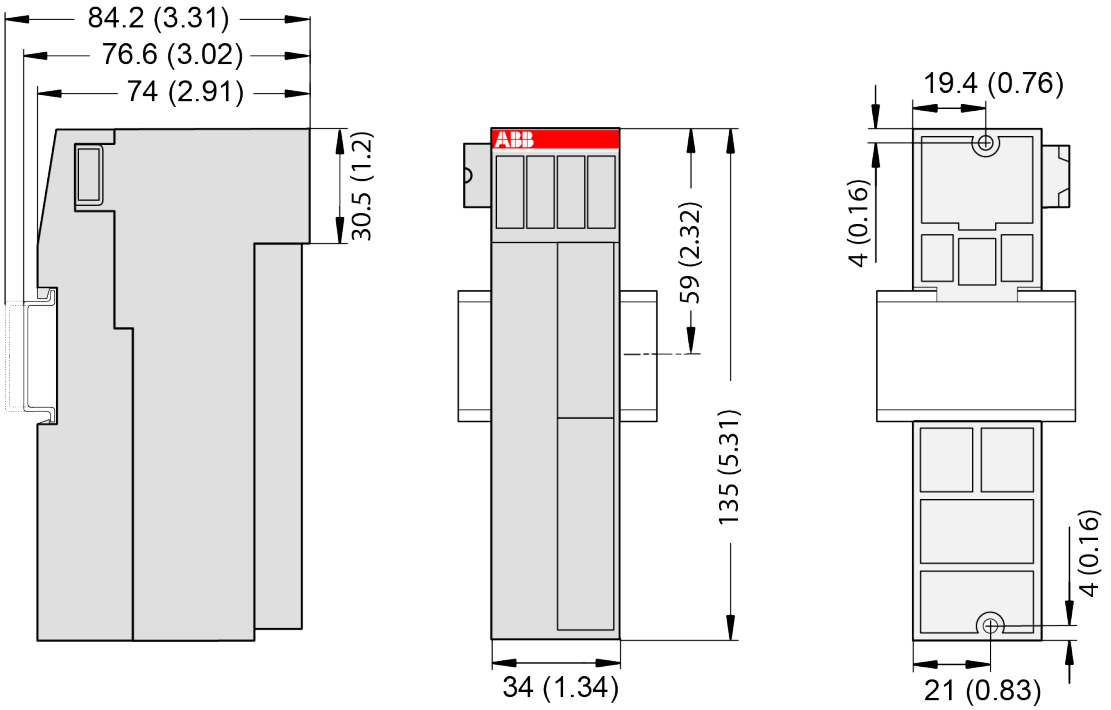
22.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

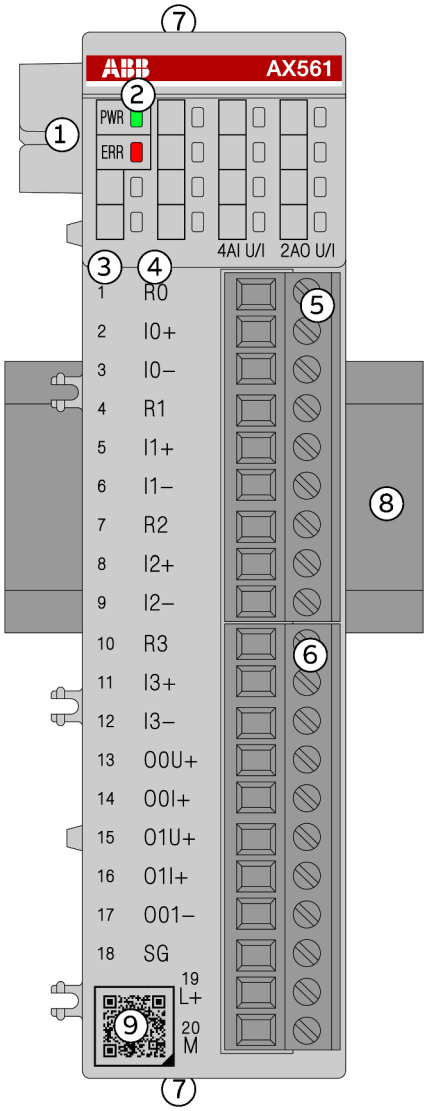
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

22.4 Dimensions



The dimensions are in mm and in brackets in inch.

22.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

22.5.1 Inputs/Outputs

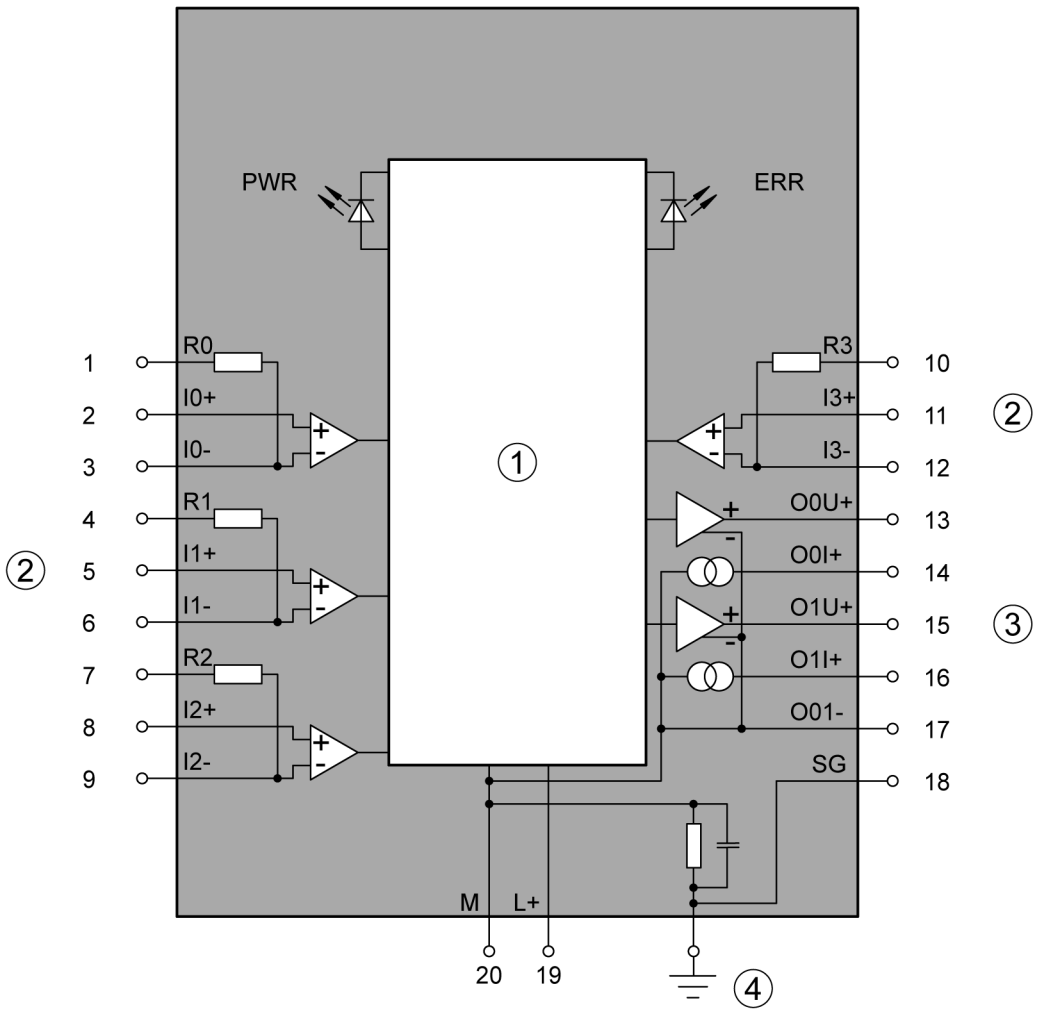


Fig. 32: Internal construction of the analog inputs and outputs

1 Logic - I/O interface
2 Analog inputs
3 Analog outputs
4 Functional earth connection

23 CD522(-XC)

- CD522
- CD522-XC



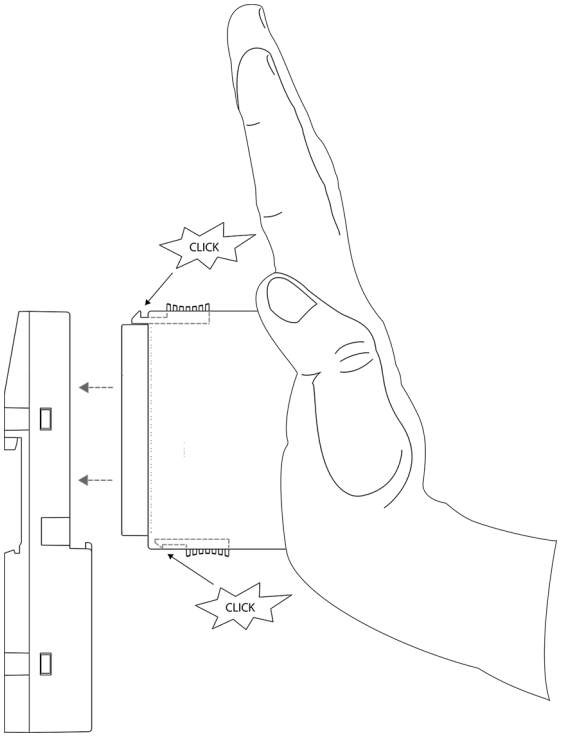
CAUTION!

Risk of injury and damaging the product!

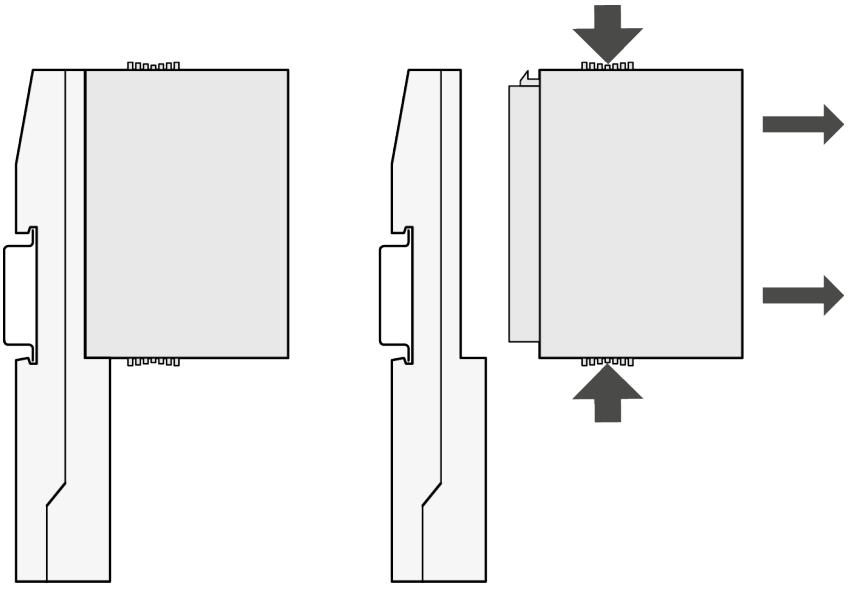
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

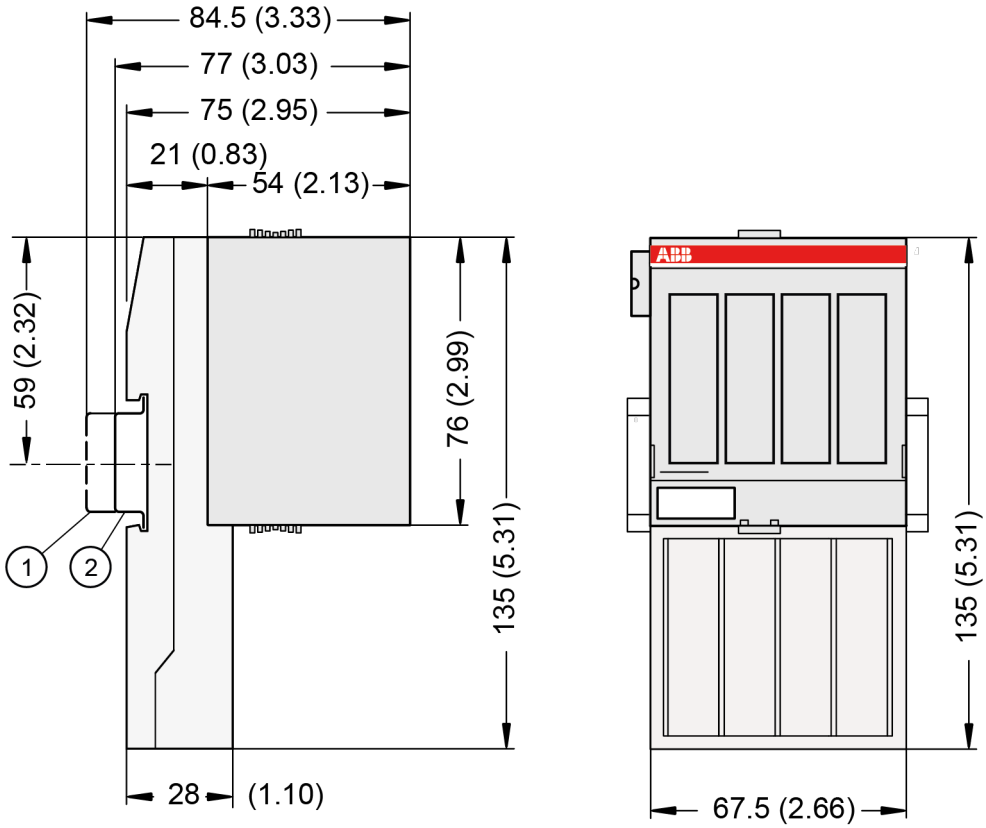
23.1 Assembly



23.2 Disassembly



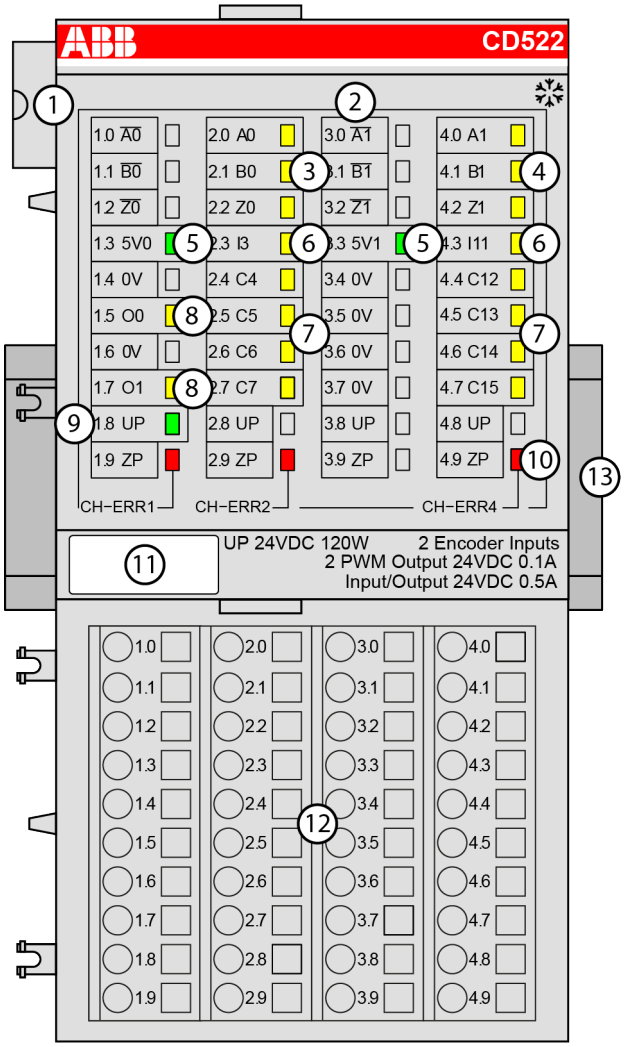
23.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

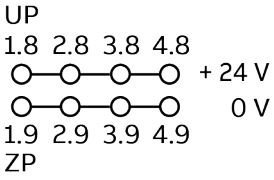
23.4 Connections



1 I/O bus
2 Allocation of terminal No. and signal name
3 3 yellow LEDs to display the signal states of the encoder 0 input
4 3 yellow LEDs to display the signal states of the encoder 1 input
5 2 green LEDs to display the 5-V-power-supply states
6 2 yellow LEDs to display the signal state of the digital input I3 and I11
7 8 yellow LEDs to display the input/output signal states
8 2 yellow LEDs to display the signal states of the PWM/pulse outputs
9 1 green LED to display the process voltage UP
10 3 red LEDs to display errors
11 Label
12 Terminal unit
13 DIN rail
❄ Sign for XC version

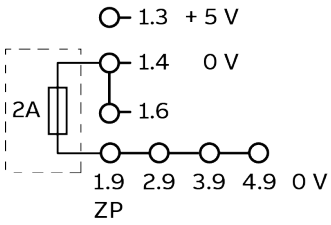
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

23.4.1 Process supply voltage

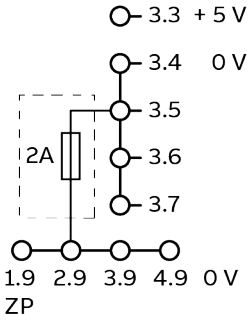


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

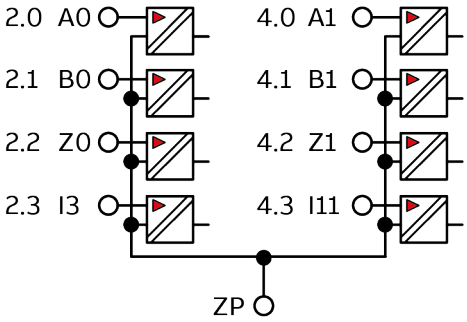
5V0



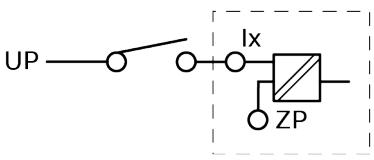
5V1



23.4.2 Inputs

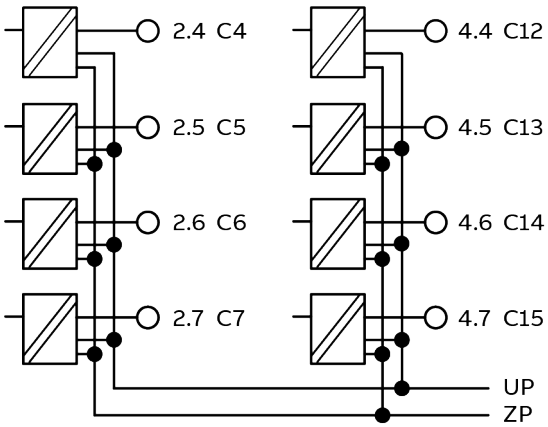


Example

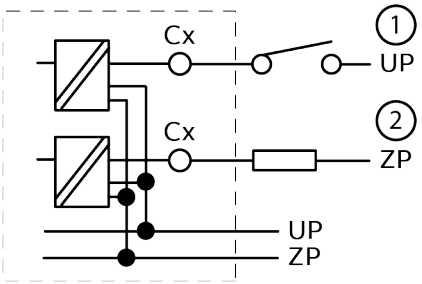


1 Example of connection input Ix

23.4.3 Inputs/Outputs



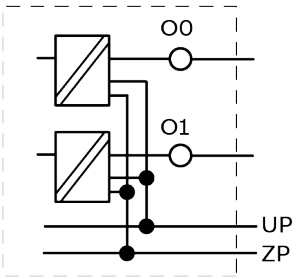
Example



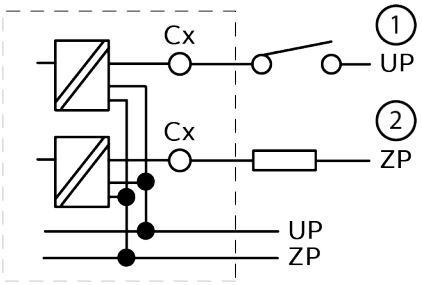
1 Example of connection as an input
2 Example of connection as an output

23.4.4 Outputs

Push-pull outputs



Example



1 Example of connection as output with UP reference
2 Example of connection as output with ZP reference

Examples of connection encoder/sensors, see description CD522.

24 CI501-PNIO(-XC)

- CI501-PNIO
- CI501-PNIO-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

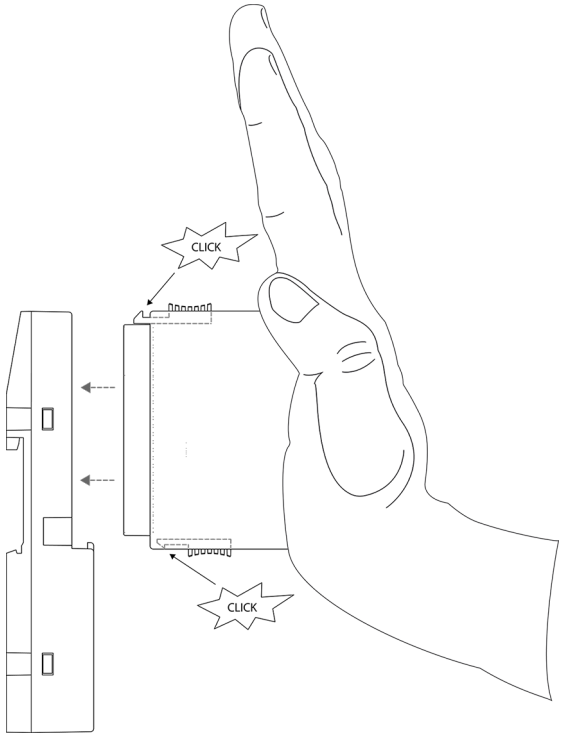
NOTICE!

Hot swap

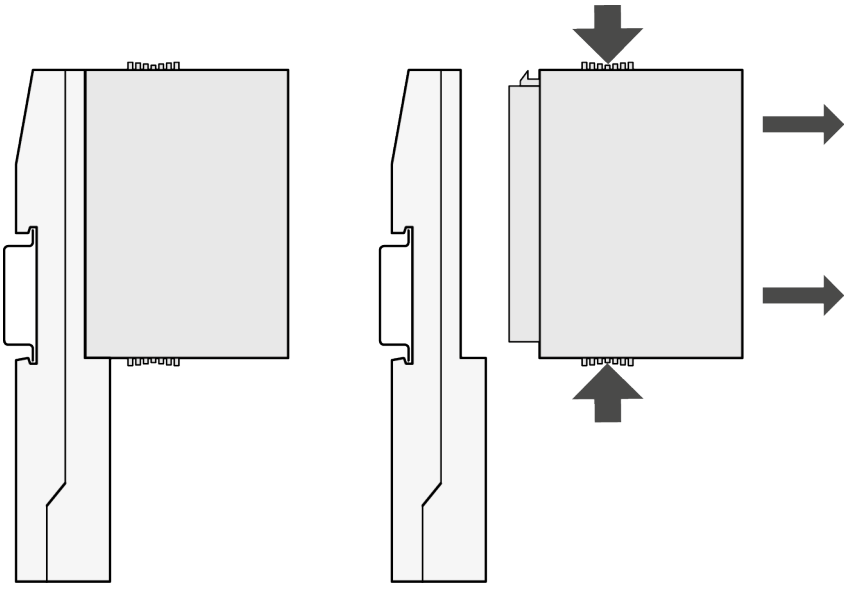
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

↳ *Chapter 4 “PLC System” on page 32*

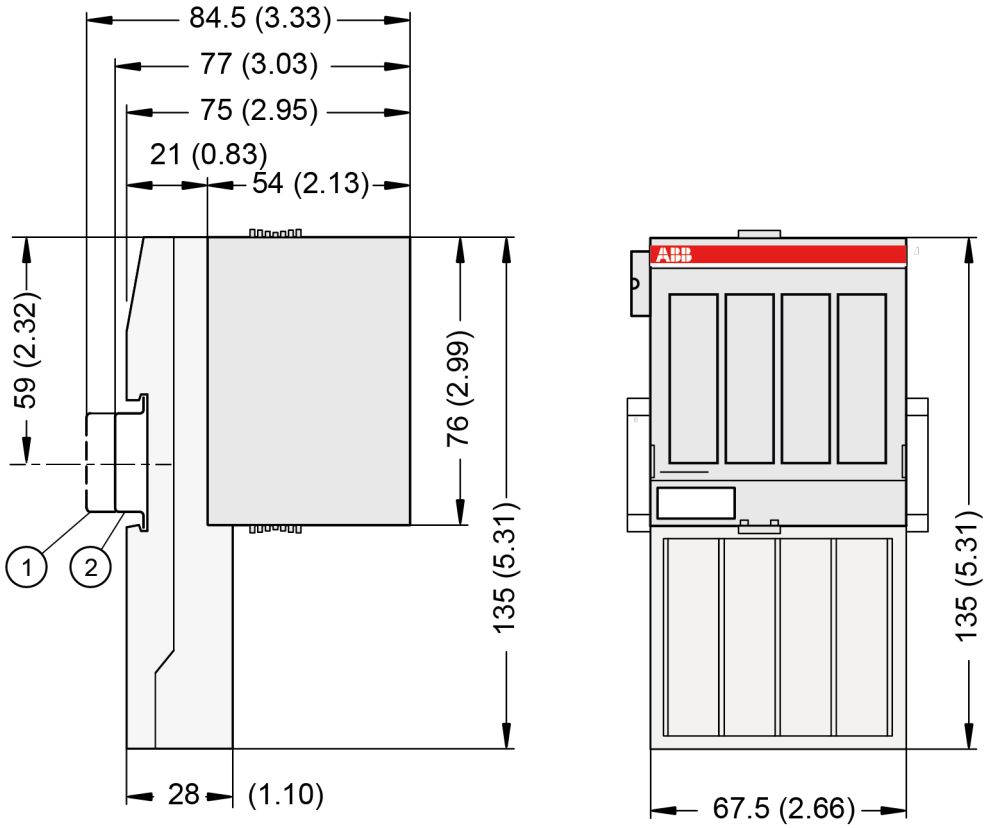
24.1 Assembly



24.2 Disassembly



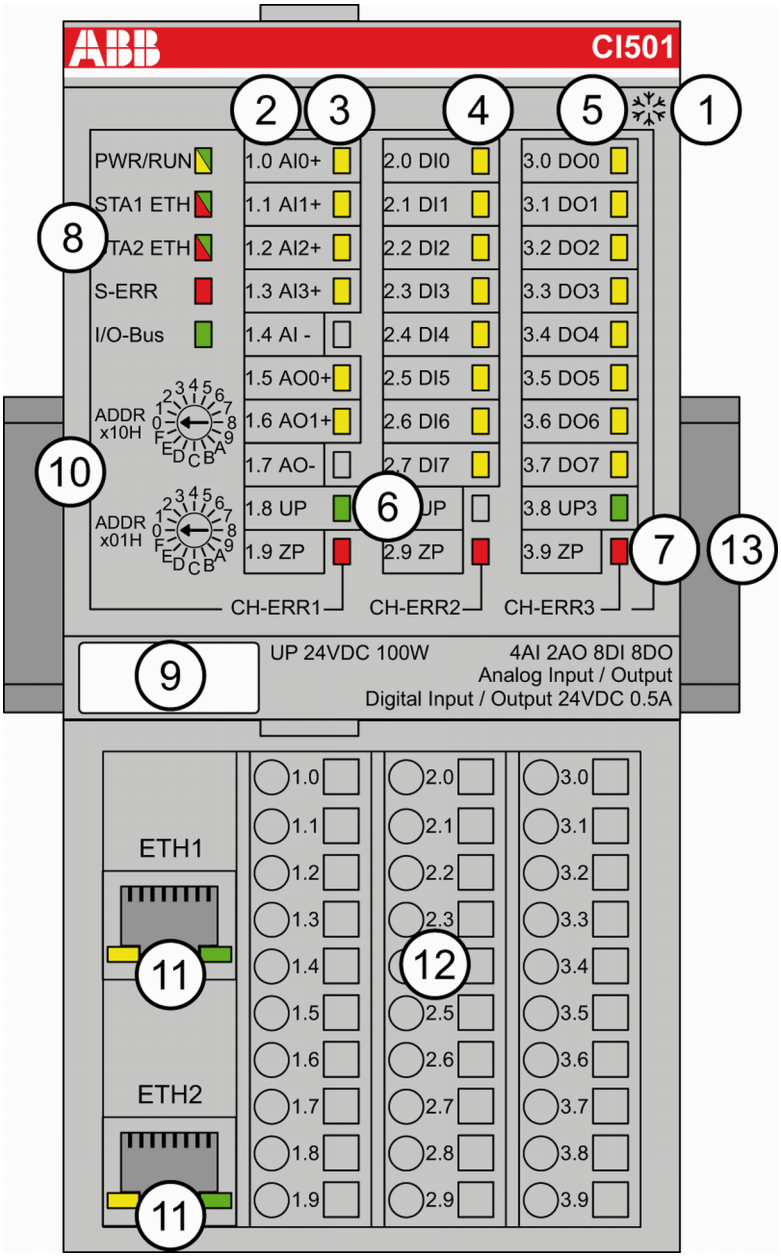
24.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

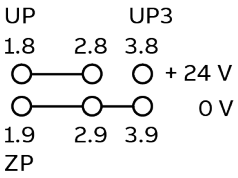
24.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 6 yellow LEDs to display the signal states of the analog inputs/outputs (AI0 ... AI3, AO0 ... AO1)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the I/O device identifier
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail
❄ Sign for XC version

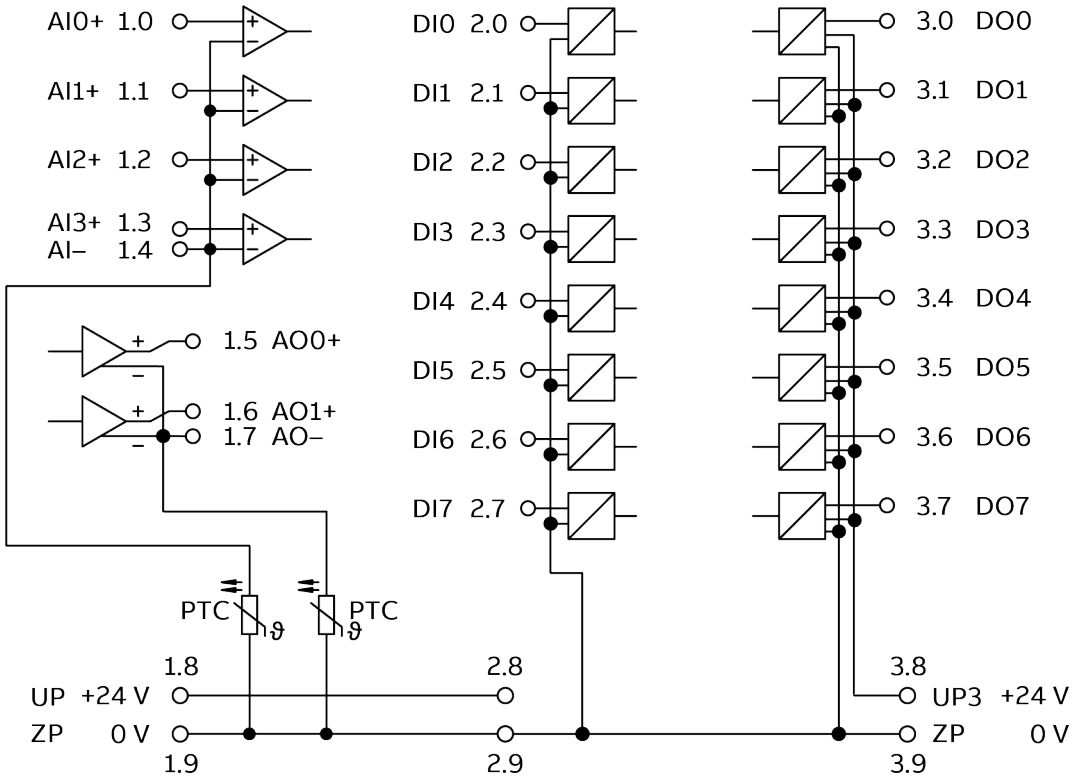
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

24.4.1 Process supply voltage

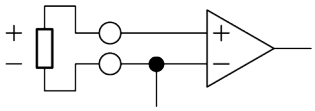


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

24.4.2 Inputs/Outputs



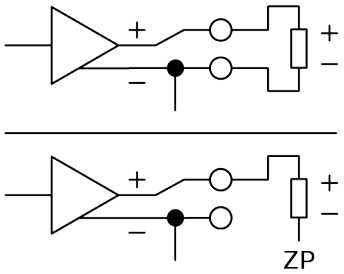
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 33: Example of connection input AIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 34: Example of connection output AOx

Example digital input

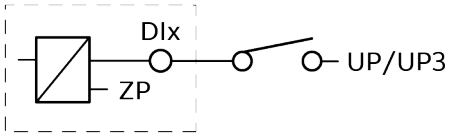


Fig. 35: Example of connection input DIx

Example digital output

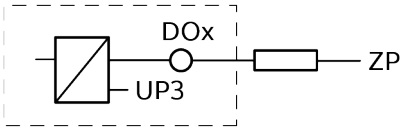
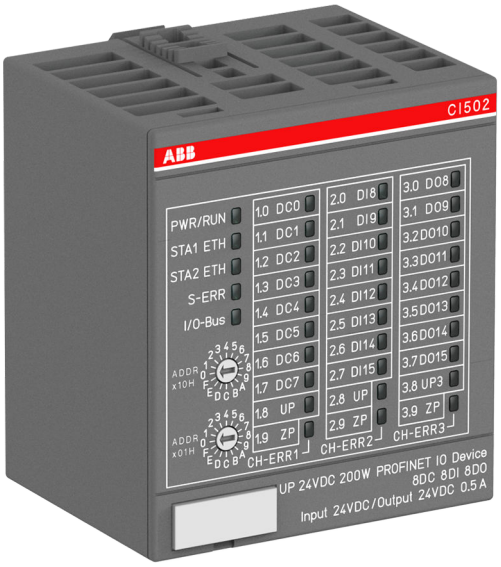


Fig. 36: Example of connection output DOx

25 CI502-PNIO(-XC)

- CI502-PNIO
- CI502-PNIO-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

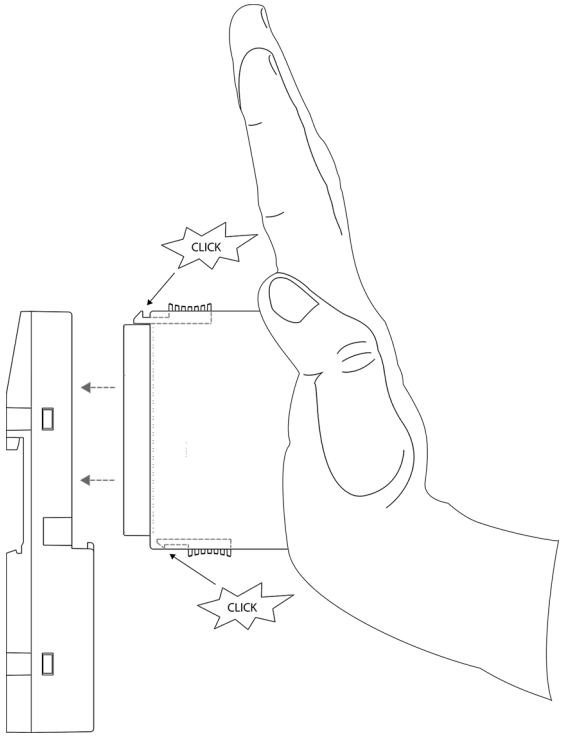
NOTICE!

Hot swap

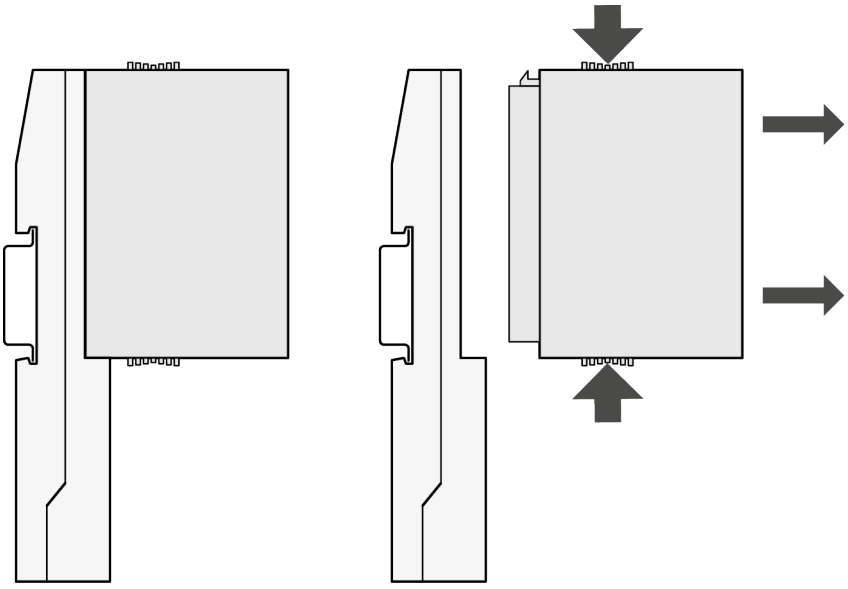
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

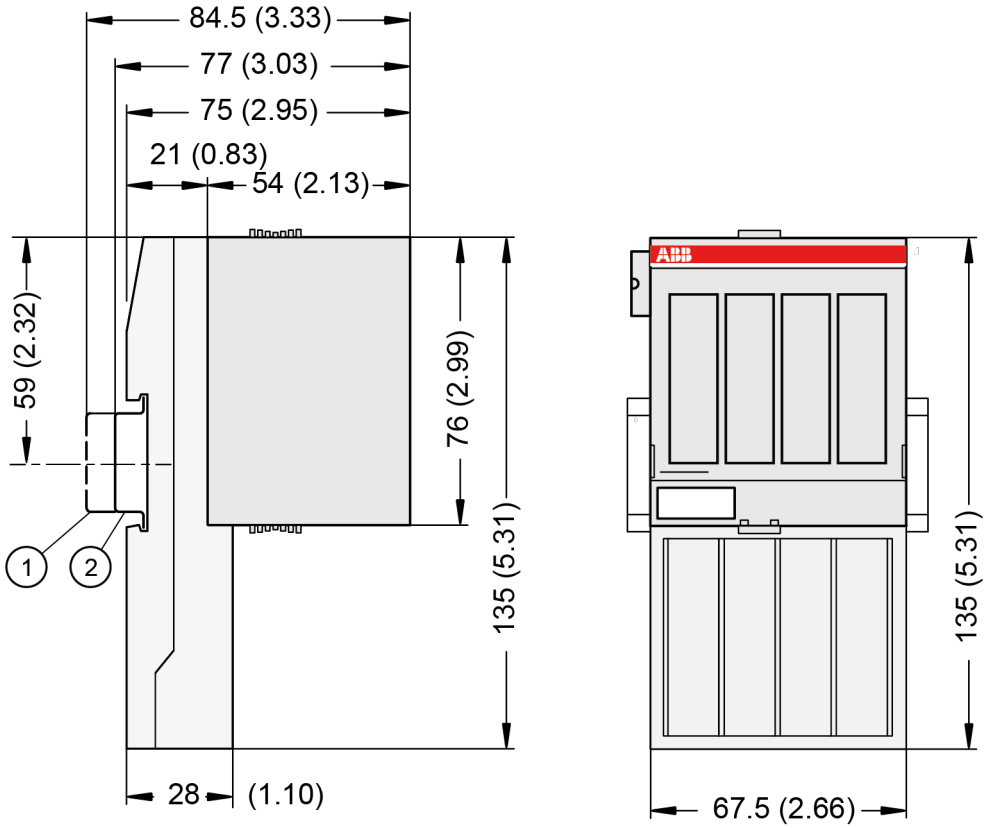
25.1 Assembly



25.2 Disassembly



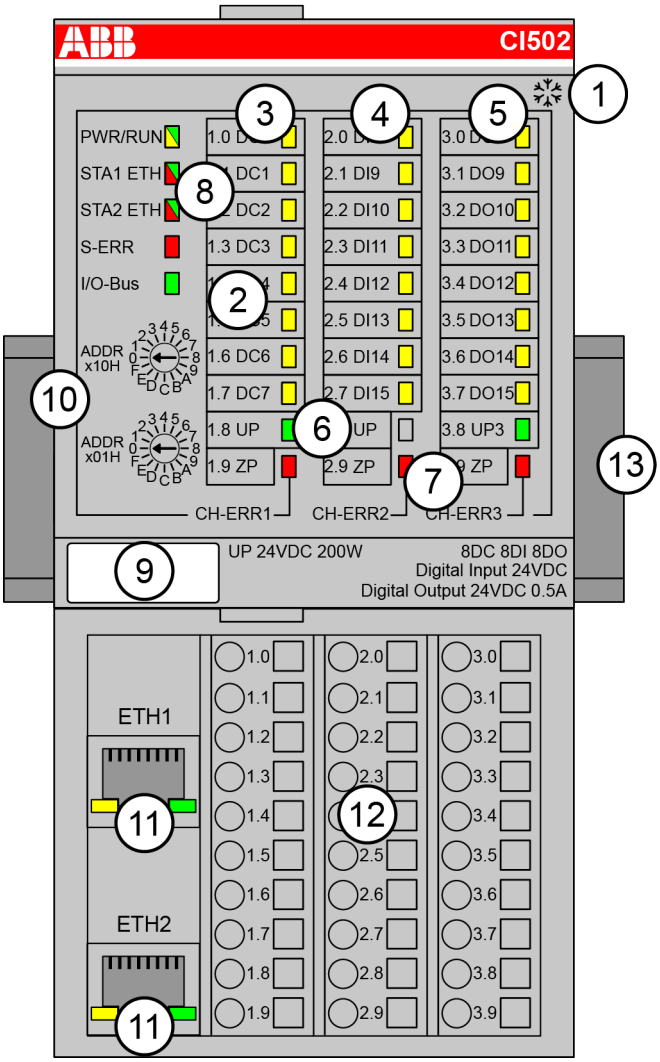
25.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

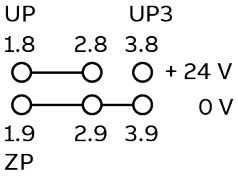
25.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the digital configurable inputs/outputs (DC0 ... DC7)
4 8 yellow LEDs to display the signal states of the digital inputs (DI8 ... DI15)
5 8 yellow LEDs to display the signal states of the digital outputs (DO8 ... DO15)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the I/O device identifier
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail
❄ Sign for XC version

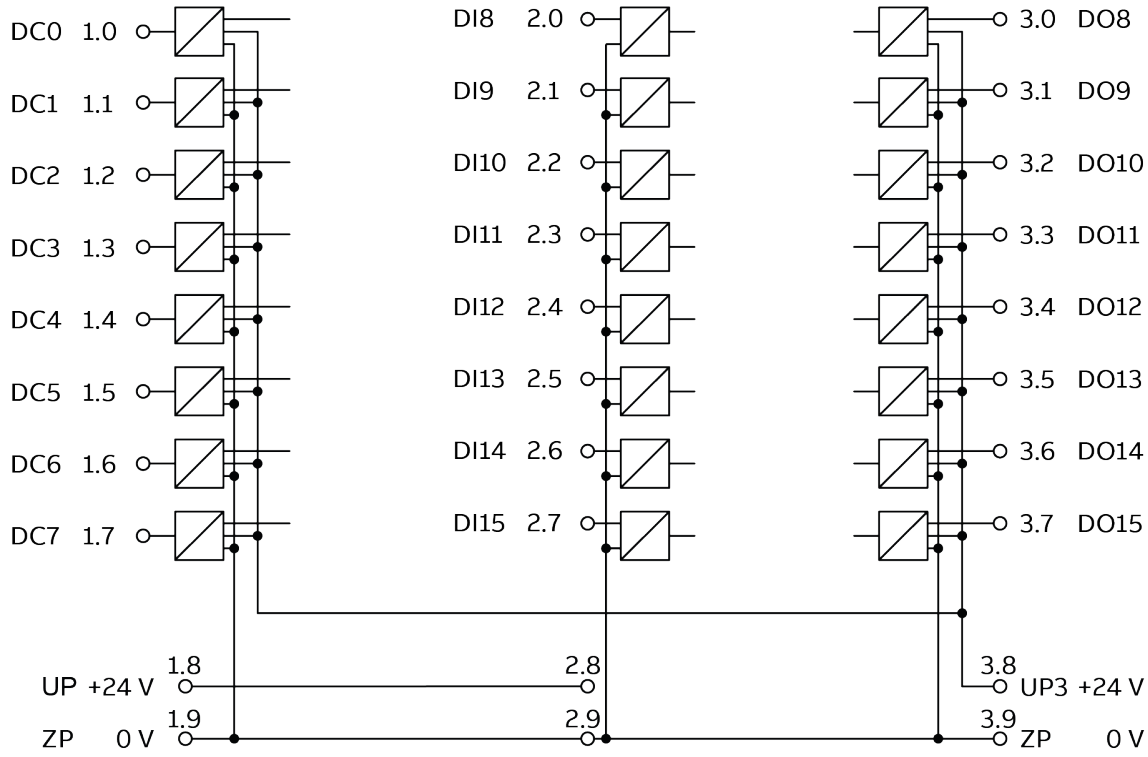
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

25.4.1 Process supply voltage

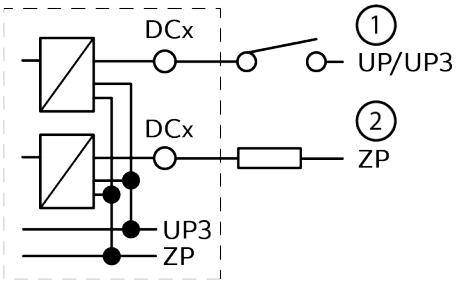


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

25.4.2 Inputs/Outputs



Example input or output



1 Example of connection as an input
2 Example of connection as an output

Example digital input

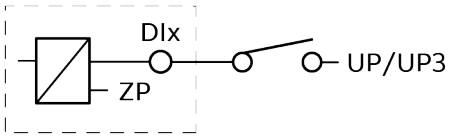


Fig. 37: Example of connection input DIx

Example digital output

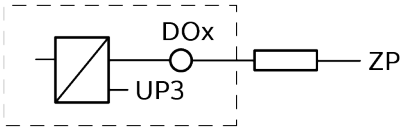
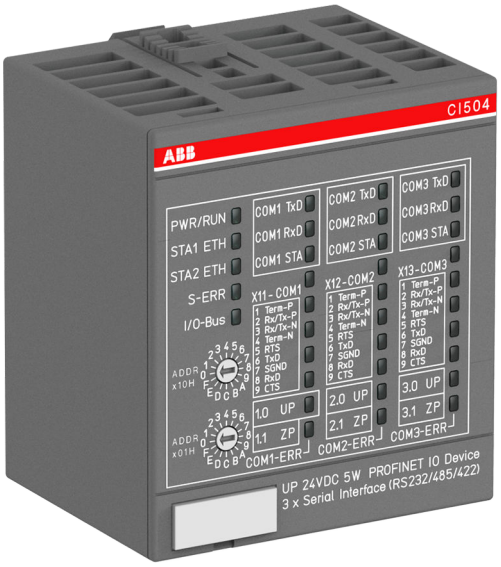


Fig. 38: Example of connection output DOx

26 CI504-PNIO(-XC)

- CI504-PNIO
- CI504-PNIO-XC



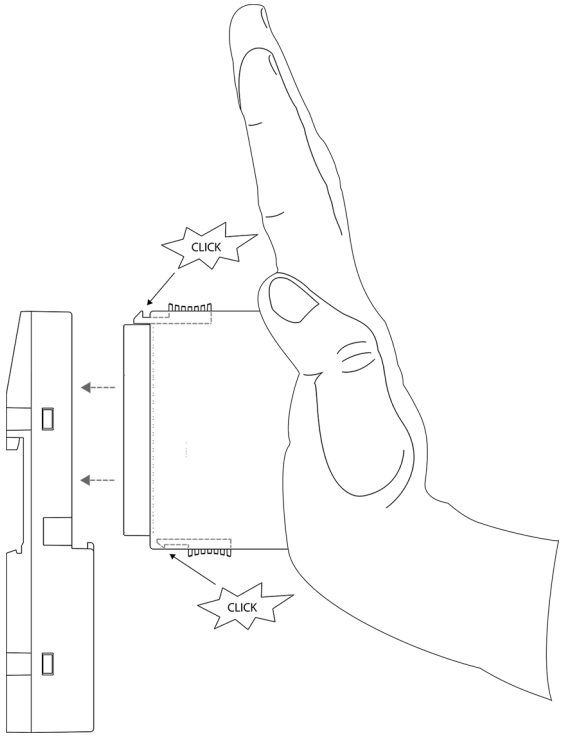
CAUTION!

Risk of injury and damaging the product!

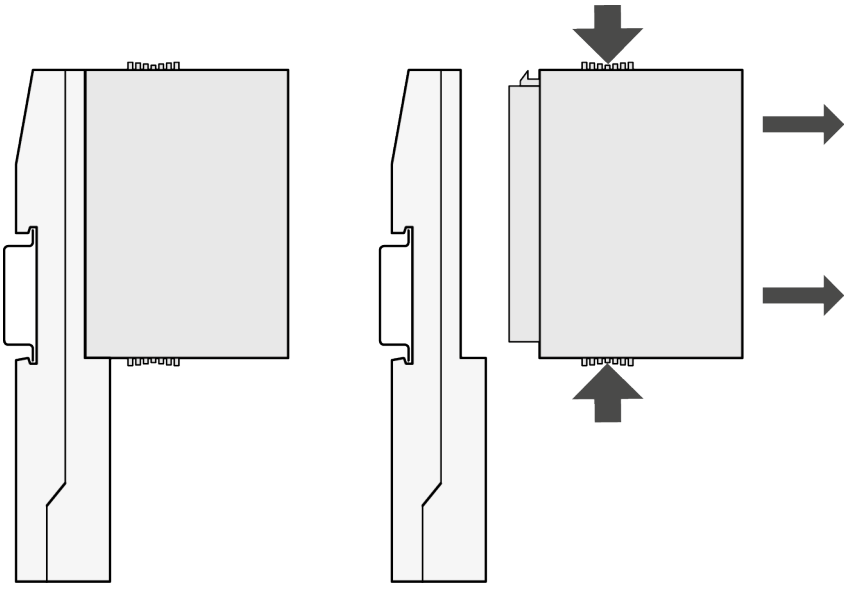
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

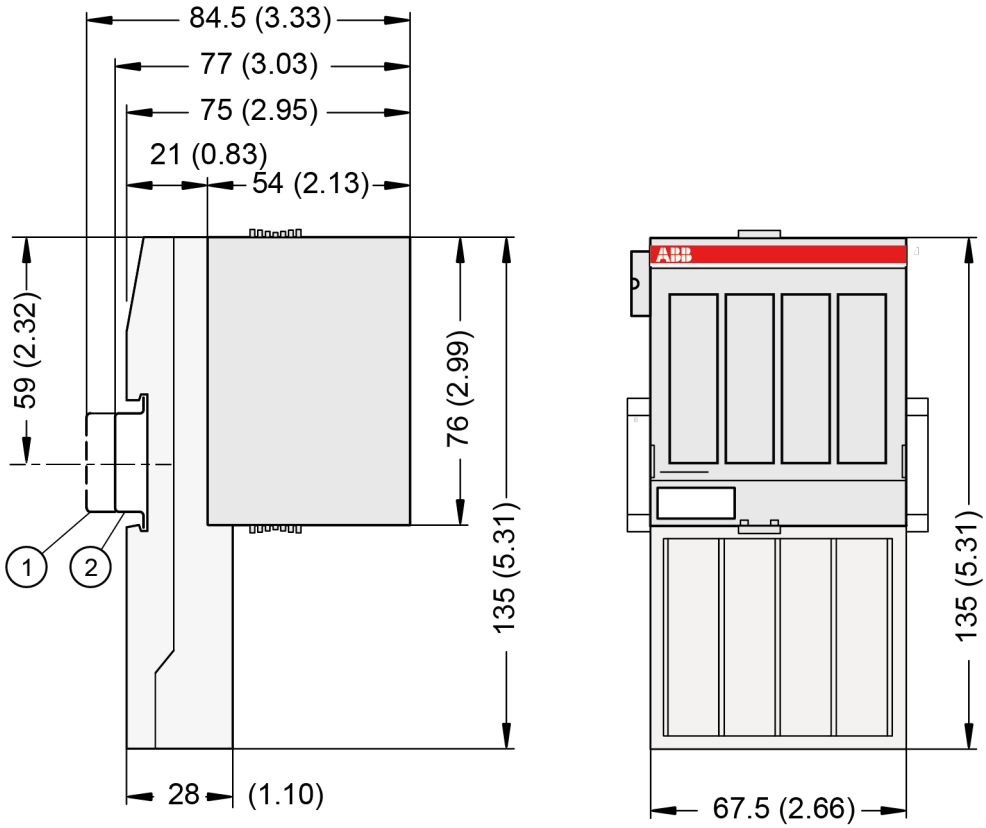
26.1 Assembly



26.2 Disassembly



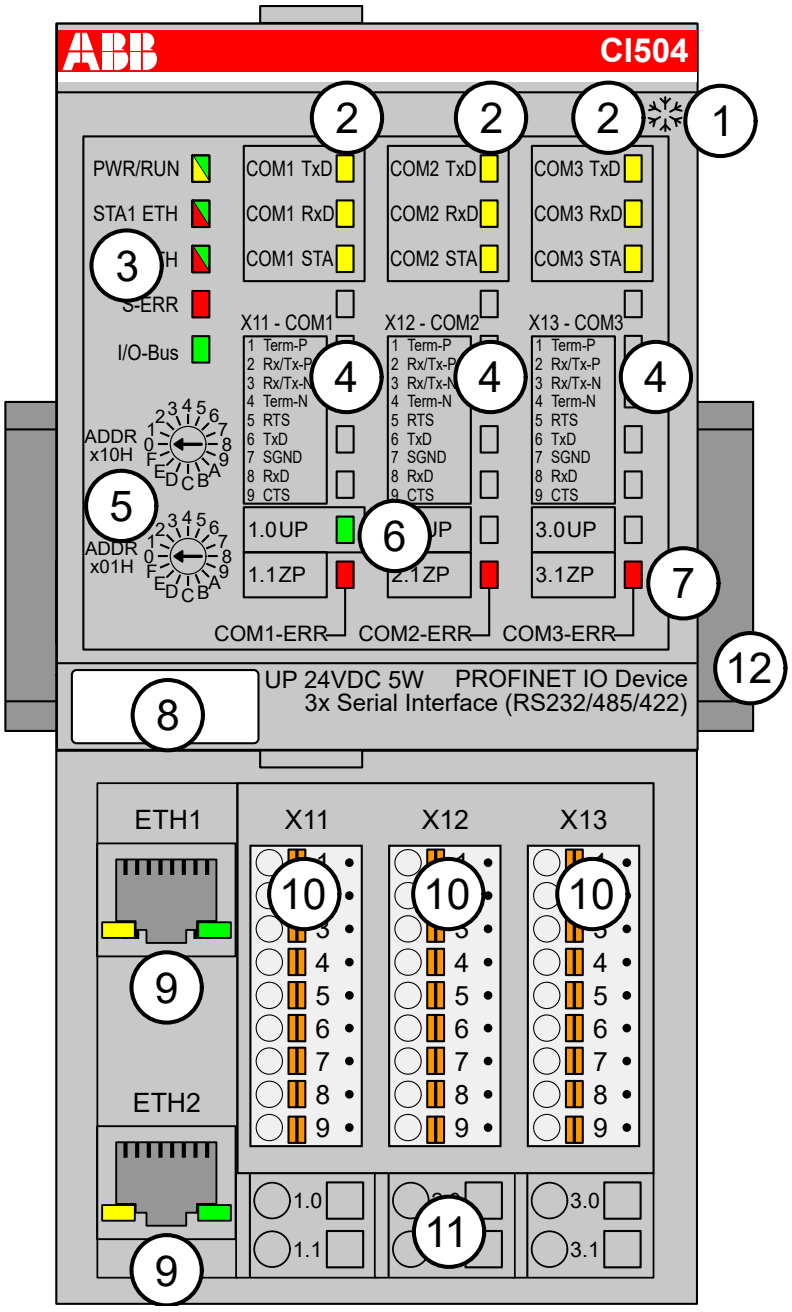
26.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

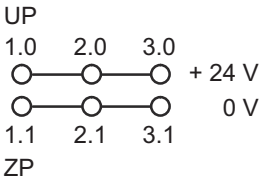
26.4 Connections



1 I/O bus
2 3 x 3 yellow LEDs to display the signal states of the serial interfaces COM1, COM2 and COM3
3 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
4 Allocation between terminal number and signal name of the serial interfaces
5 2 rotary switches for setting the I/O device identifier
6 1 green LED to display the process voltage UP
7 3 red LEDs to display errors (COM1-ERR, COM2-ERR, COM3-ERR) of the serial interfaces
8 Label
9 Ethernet Interfaces (ETH1, ETH2) on the terminal unit
10 3 removable connectors to connect the interfaces
11 6 spring terminals for power supply voltage (UP)
12 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

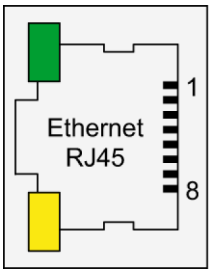
26.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

26.4.2 Ethernet network interfaces

Pin assignment

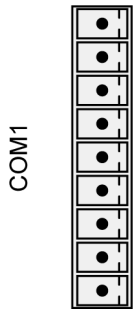
Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

In corrosive environment, please protect unused connectors using the TA535 accessory.

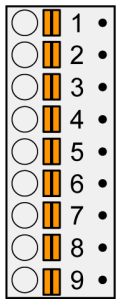
Not supplied with this device.

26.4.3 Serial interfaces COM1/COM2/COM3

Pin assignment (RS-485 / RS-232)



Terminal block removed



Terminal block inserted

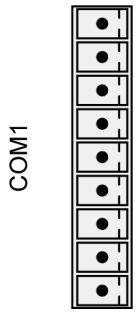
Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

NOTICE!

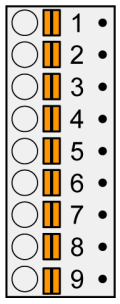
Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

Pin assignment (RS-422)



Terminal block removed



Terminal block inserted

PIN	Signal	Interface	Description
1	Terminator P/ RxD+	RS-422	Terminator P/ Receive, positive
2	TxD+	RS-422	Transmit, positive
3	TxD-	RS-422	Transmit, negative
4	Terminator N/ RxD-	RS-422	Terminator N/ Receive, negative
5			
6			
7	SGND	RS-422	Signal Ground
8			
9			

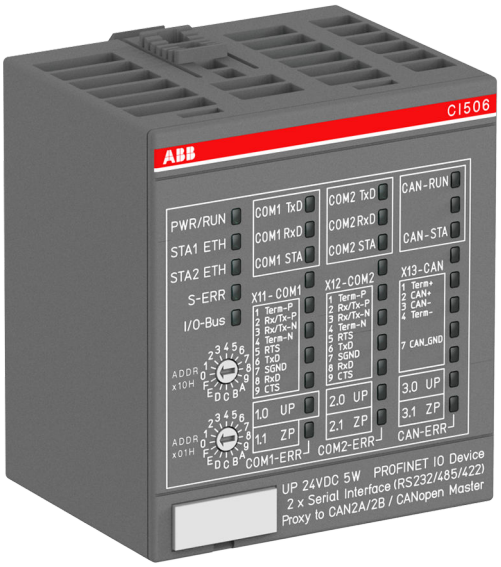
NOTICE!

Resistors are connected inside the module

The line-terminating resistors are connected inside the module. Additional resistors are not necessary

27 CI506-PNIO(-XC)

- CI506-PNIO
- CI506-PNIO-XC



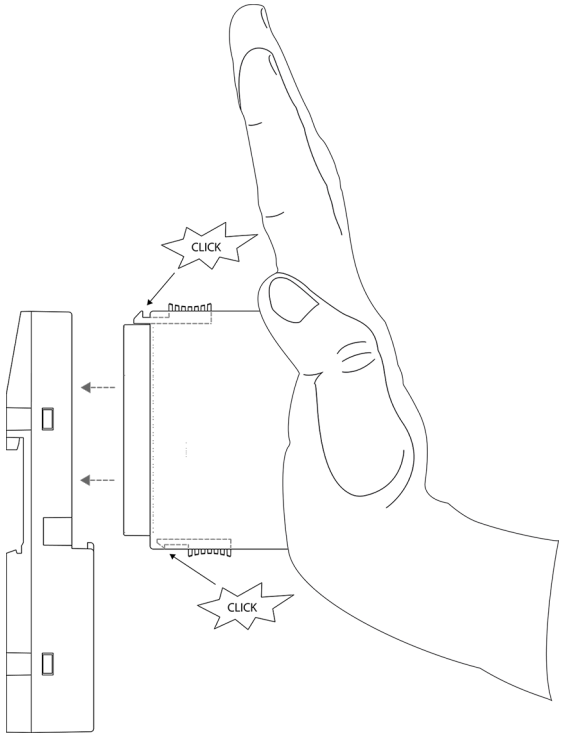
CAUTION!

Risk of injury and damaging the product!

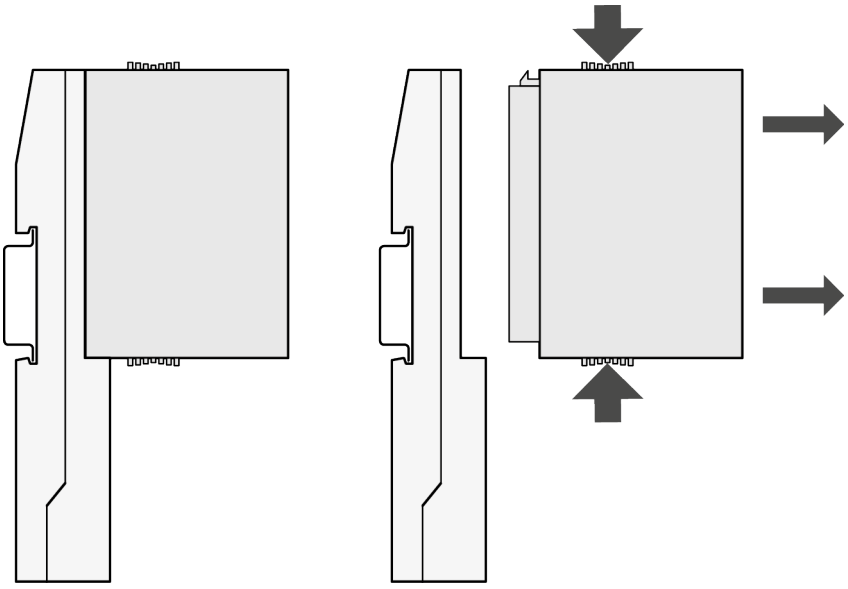
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

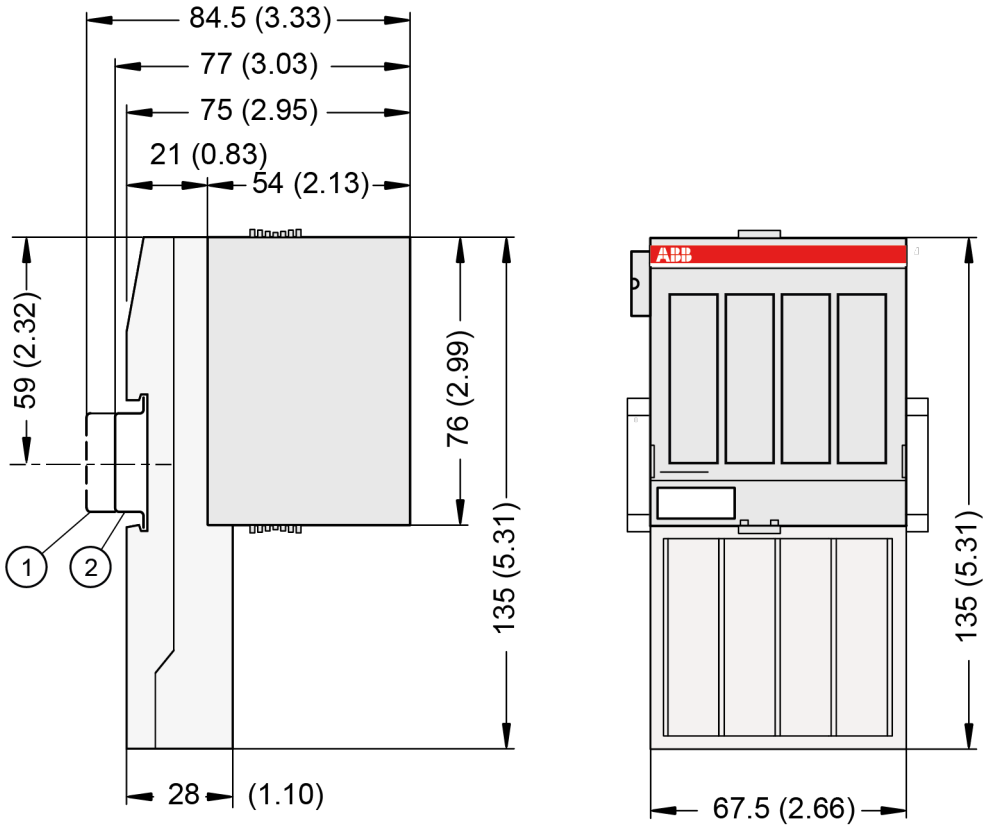
27.1 Assembly



27.2 Disassembly



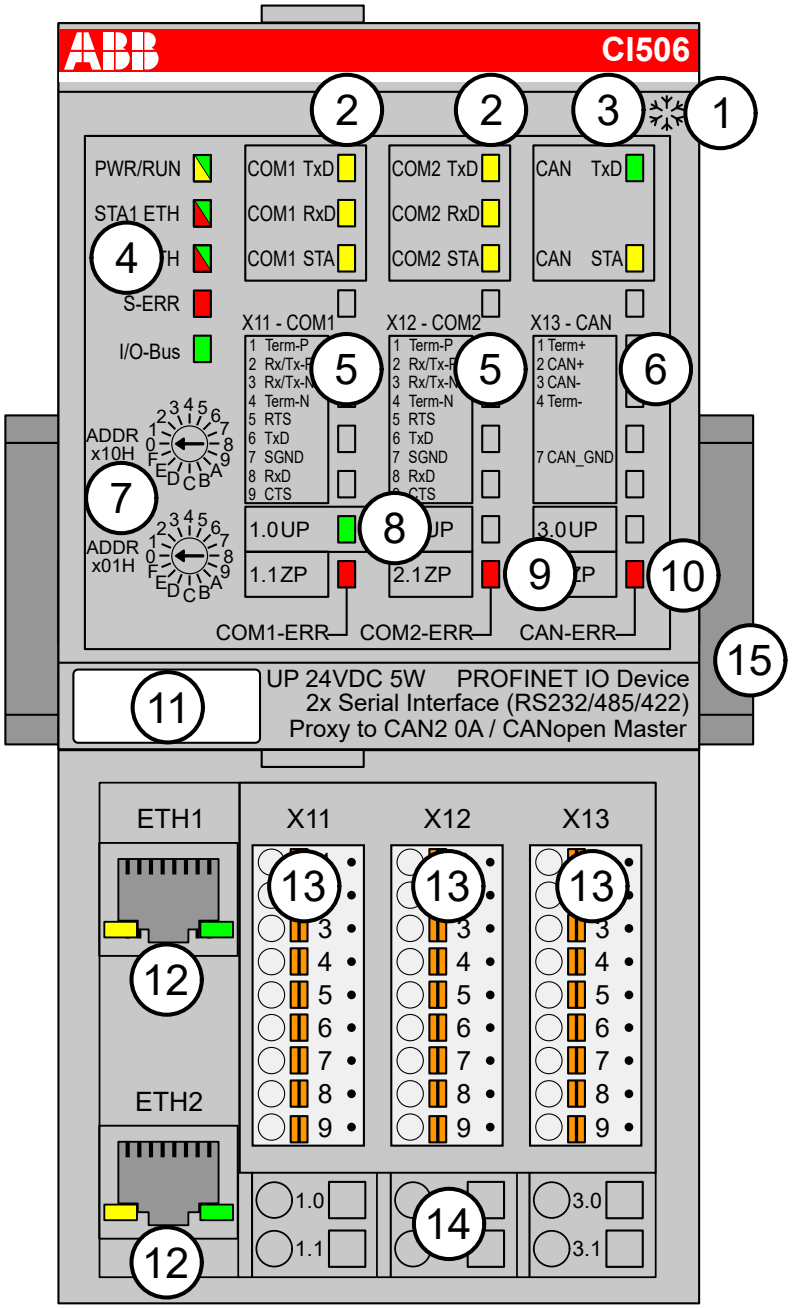
27.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

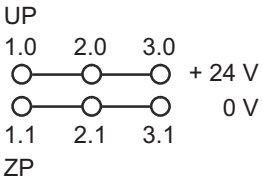
27.4 Connections



1 I/O bus
2 2 x 3 yellow LEDs to display the signal states of the serial interfaces COM1 and COM2
3 1 green and 1 yellow LEDs to display the signal states of the CANopen interface
4 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
5 Allocation between terminal number and signal name of the serial interfaces
6 Allocation between terminal number and signal name of the CANopen interface
7 2 rotary switches for setting the I/O device identifier
8 1 green LED to display the process voltage UP
9 2 red LEDs to display errors (COM1-ERR, COM2-ERR) of the serial interfaces
10 1 red LED to display errors (CAN-ERR) of the CANopen interface
11 Label
12 Ethernet Interfaces (ETH1, ETH2) on the terminal unit
13 3 removable connectors to connect the subordinated interfaces
14 6 spring terminals for power supply voltage (UP)
15 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

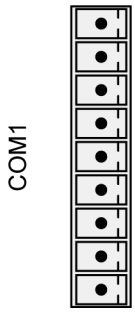
27.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

27.4.2 Serial interface COM1/COM2

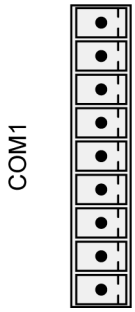
Pin assignment (RS-485 / RS-232)



Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

NOTICE!
Unused connector!
Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

Pin assignment (RS-422)



Terminal block removed

Terminal block inserted

PIN	Signal	Interface	Description
1	Terminator P/ RxD+	RS-422	Terminator P/ Receive, positive
2	TxD+	RS-422	Transmit, positive
3	TxD-	RS-422	Transmit, negative
4	Terminator N/ RxD-	RS-422	Terminator N/ Receive, negative
5			
6			
7	SGND	RS-422	Signal Ground
8			
9			

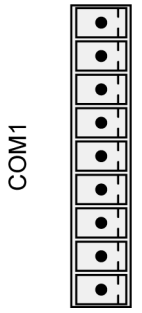
NOTICE!

Resistors are connected inside the module

The line-terminating resistors are connected inside the module. Additional resistors are not necessary

27.4.3 CANopen interface

Pin assignment



Terminal block removed

Terminal block inserted

PIN	Signal	Description
1	Term +	Terminator, positive
2	CAN +	CAN, positive
3	CAN -	CAN, negative
4	Term -	Terminator, negative
5		
6		
7	CAN GND	CAN Ground
8		
9		

NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

28 CI511-ETHCAT

- CI511-ETHCAT



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

NOTICE!

The section "Hot Swap" is only valid for CI501-PNIO(-XC) and CI521-MODTCP(-XC).

NOTICE!

Risk of device damage!

– I/O modules with a device index **above** F0 can be hot-swapped. When I/O modules **below** F0 are inserted or removed from the terminal unit in a powered system the I/O modules can be damaged.
  Before hot swapping a device, check the device index and ensure that the modules meet the requirements. *Table 2 “Allowed device indexes for I/O modules for hot swapping” on page 189*
– Terminal units that support hot swapping of I/O modules have the appendix TU5xx**-H**.
– Hot swap is not supported by AC500-eCo CPU!

The following I/O bus masters support hot swapping of attached I/O modules:

– Communication interface modules CI5xx as of index F0.
– Processor modules PM56xx-2ETH with firmware version as of V3.2.0.

Table 2: Allowed device indexes for I/O modules for hot swapping

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
AC522(-XC)	F0	F0
AI523 (-XC)	F0	D2
AI531	F0	D4
AI531-XC	F0	D2
AI561	hot swap is not supported	B2
AI562	hot swap is not supported	B2
AI563	hot swap is not supported	B3
AI564	hot swap is not supported	A0
AI565	hot swap is not supported	A0
AI568	hot swap is not supported	A0
AI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
AO522 (-XC)	F0	F0
AO523 (-XC)	F0	D2
AO561	hot swap is not supported	B2
AO562	hot swap is not supported	A0
AO568	hot swap is not supported	A0
AX521 (-XC)	F0	D2
AX522 (-XC)	F0	D2
AX561	hot swap is not supported	B2
CD522 (-XC)	hot swap is not supported	D1
DA501 (-XC)	F0	D2
DA502 (-XC)	F0	F0
DC522 (-XC)	F0	D2
DC523 (-XC)	F0	D2

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
DC532 (-XC)	F0	D2
DC562	hot swap is not supported	A2
DI524 (-XC)	F0	D2
DI561	hot swap is not supported	B2
DI562	hot swap is not supported	B2
DI571	hot swap is not supported	B2
DI572	hot swap is not supported	A1
DI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
DO524 (-XC)	F0	A3
DO526	F0	A2
DO526-XC	F0	A0
DO561	hot swap is not supported	B2
DO562	hot swap is not supported	A2
DO571	hot swap is not supported	B3
DO572	hot swap is not supported	B2
DO573	hot swap is not supported	A1
DX522 (-XC)	F0	D2
DX531	F0	D2
DX561	hot swap is not supported	B2
DX571	hot swap is not supported	B3
DX581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
FM562	F0	A1
FM565	hot swap is not supported	A0
FM566	hot swap is not supported	A0

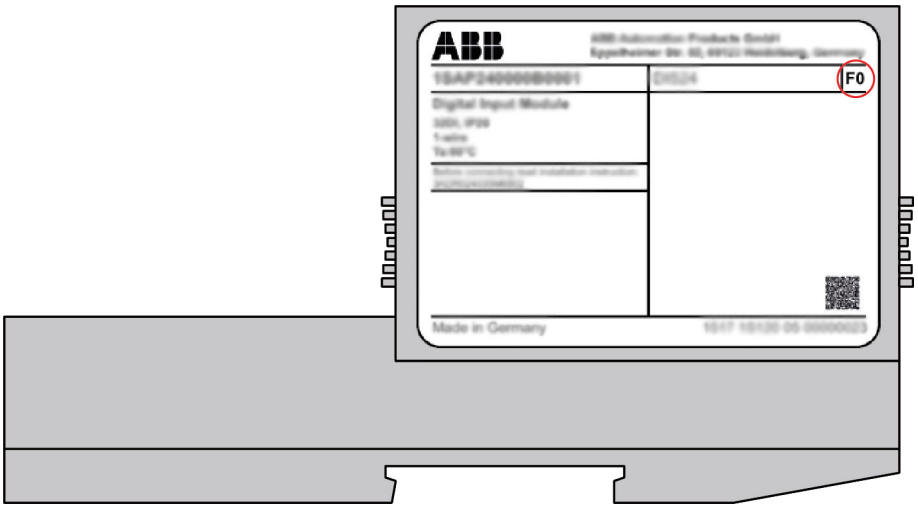


Fig. 39: The index of the module is in the right corner of the label.

WARNING!

Risk of explosion or fire in hazardous environments during hot swapping!

Hot swap must not be performed in flammable environments to avoid life-threatening injury and property damage resulting from fire or explosion.

WARNING!

Electric shock due to negligent behavior during hot swapping!

To avoid electric shock, do the following.

- Make sure the following conditions apply:
  - Digital outputs are not under load.
  - Input/output voltages above safety extra low voltage/ protective extra low voltage (SELV/PELV) are switched off.
  - Modules are fully interlocked with the terminal unit with both snap-fits engaged before switching on loads or input/output voltage.
- Never touch exposed contacts (dangerous voltages).
- Stay away from electrical contacts to avoid arc discharge.
- Do not operate a mechanical installation improperly.

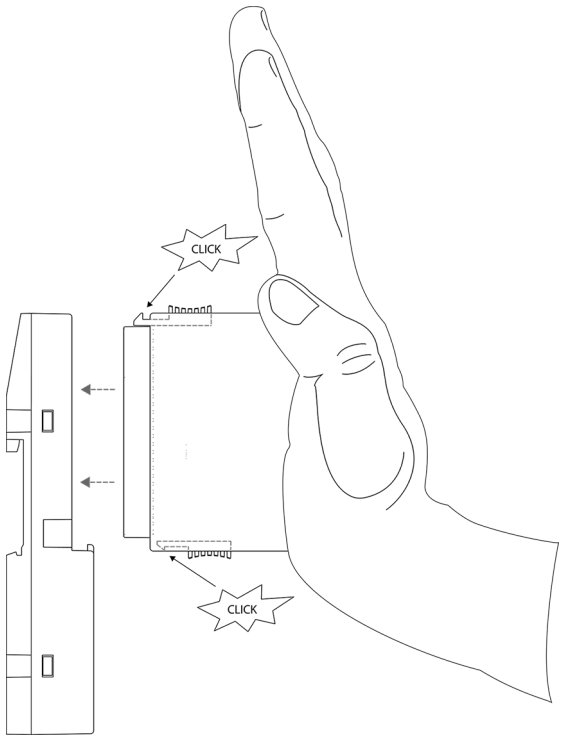
NOTICE!

Risk of damage to I/O modules!

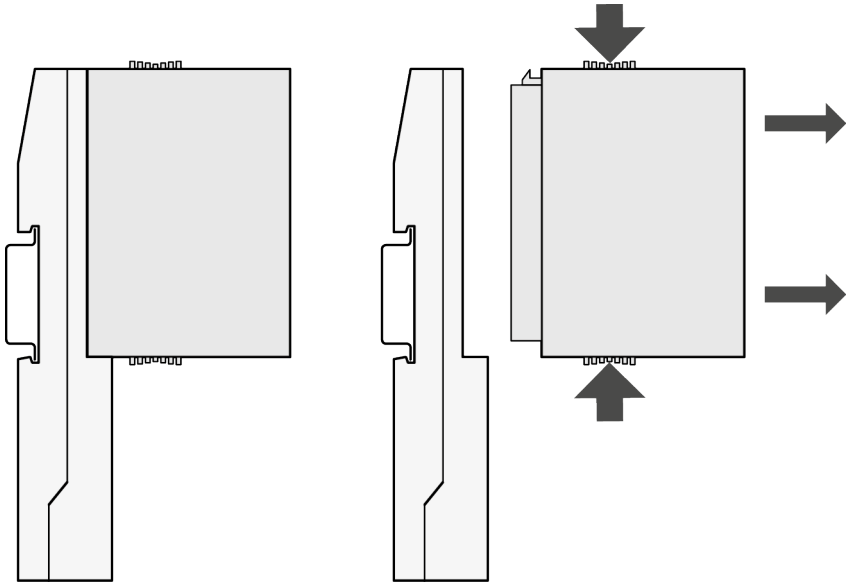
Hot swapping is only allowed for I/O modules.

Processor modules and communication interface modules must not be removed or inserted during operation.

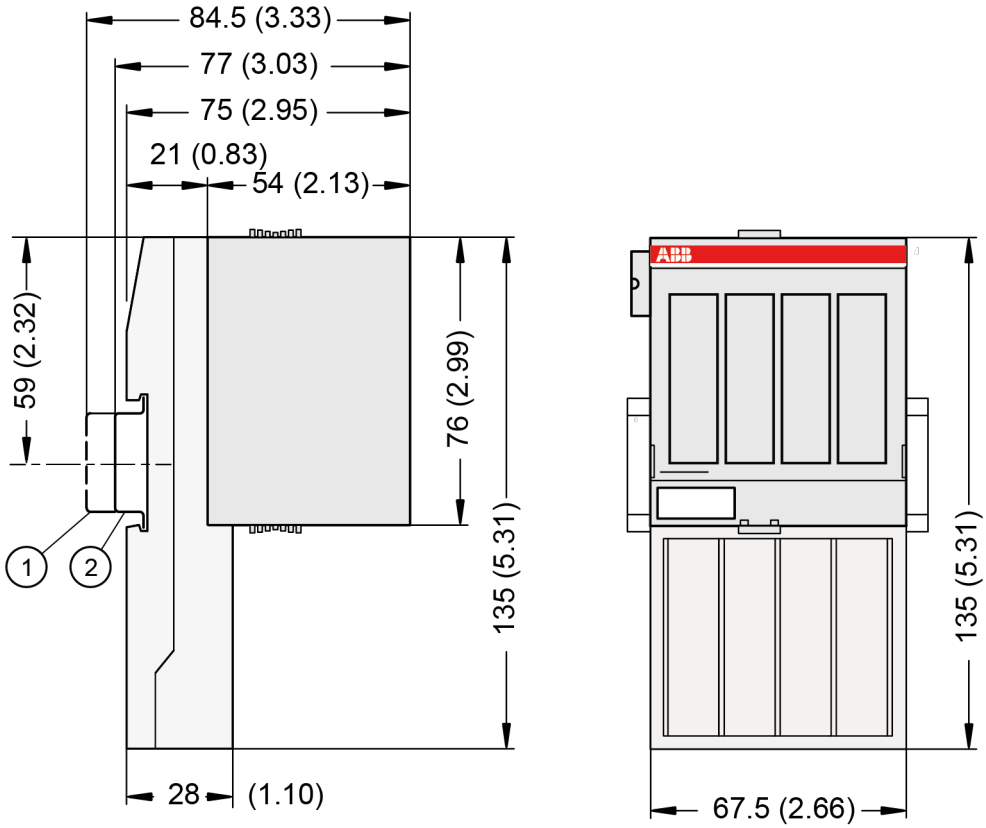
28.1 Assembly



28.2 Disassembly



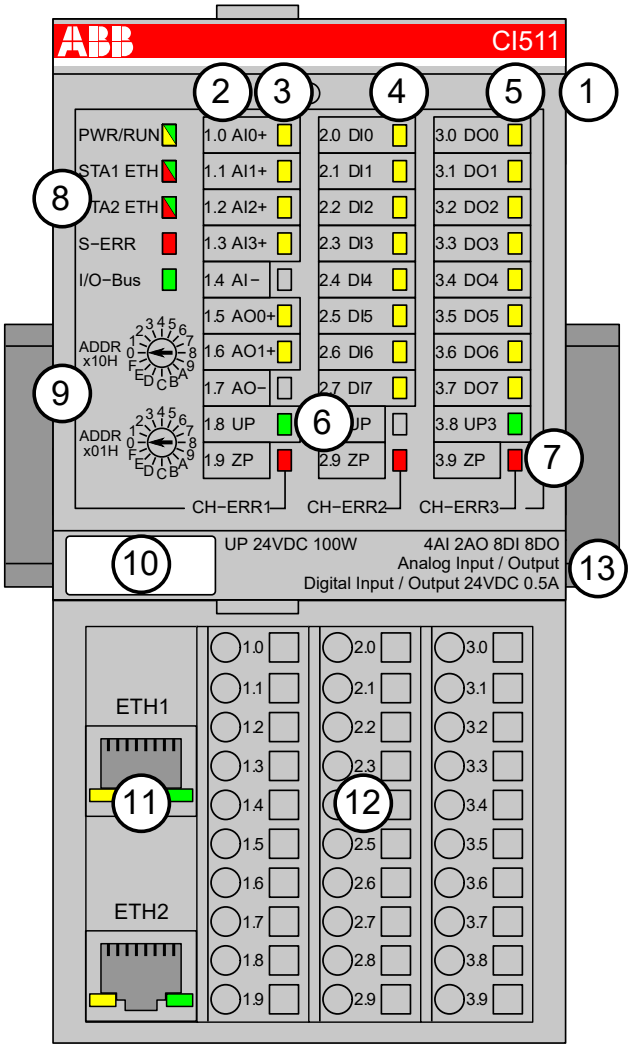
28.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

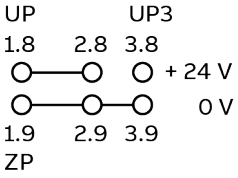
28.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 6 yellow LEDs to display the signal states of the analog inputs/outputs (AI0 ... AI3, AO0 ... AO1)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, NET, DC, S-ERR, I/O-Bus
9 2 rotary switches (reserved for future extensions)
10 Label
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail

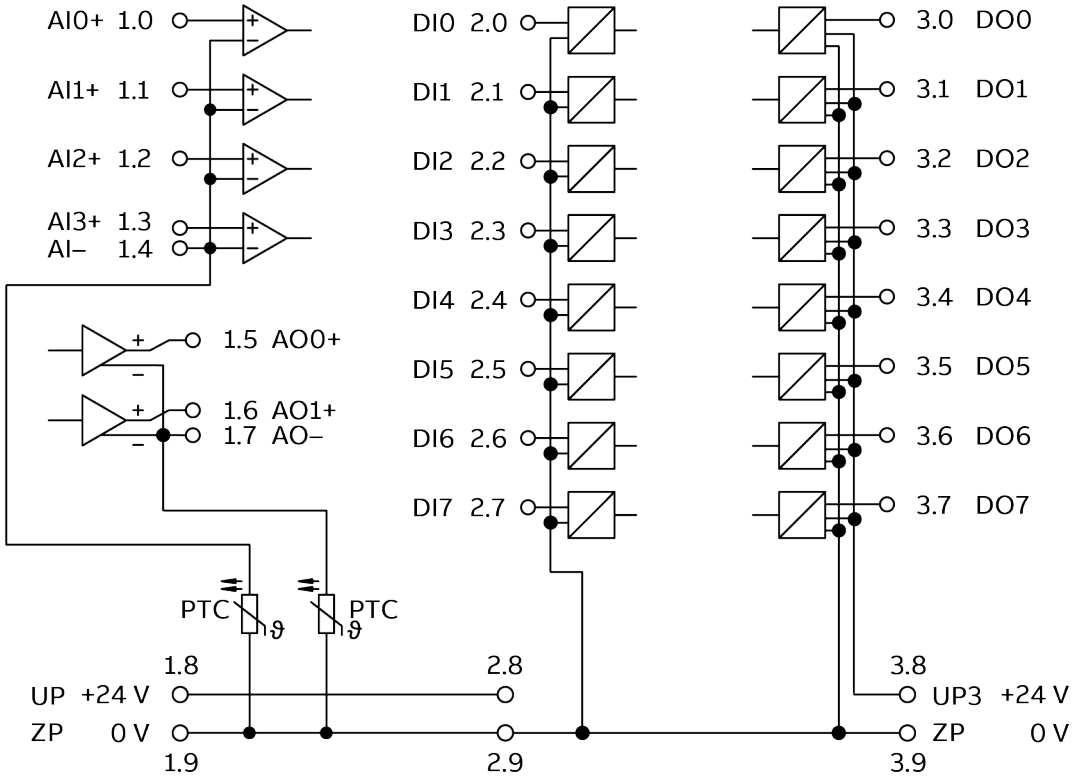
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

28.4.1 Process supply voltage

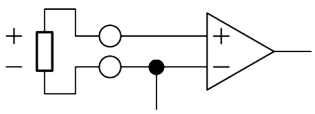


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

28.4.2 Inputs/Outputs



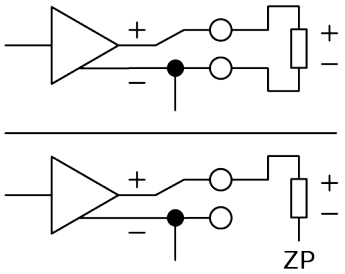
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 40: Example of connection input AIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 41: Example of connection output AOx

Example digital input

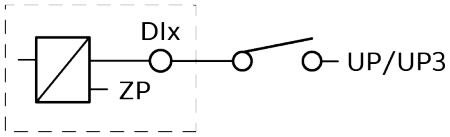


Fig. 42: Example of connection input DIx

Example digital output

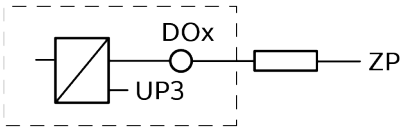
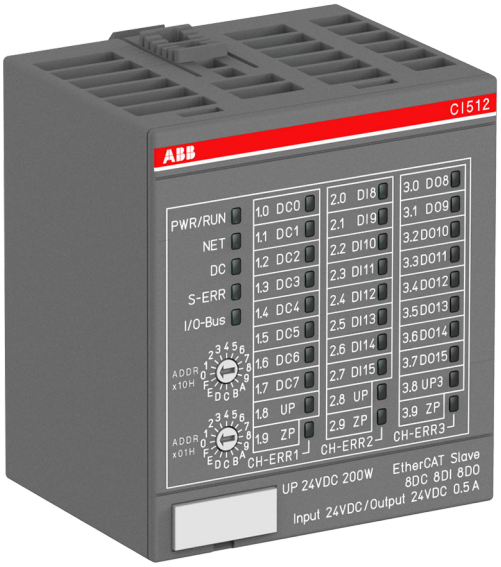


Fig. 43: Example of connection output DOx

29 CI512-ETHCAT

- CI512-ETHCAT



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

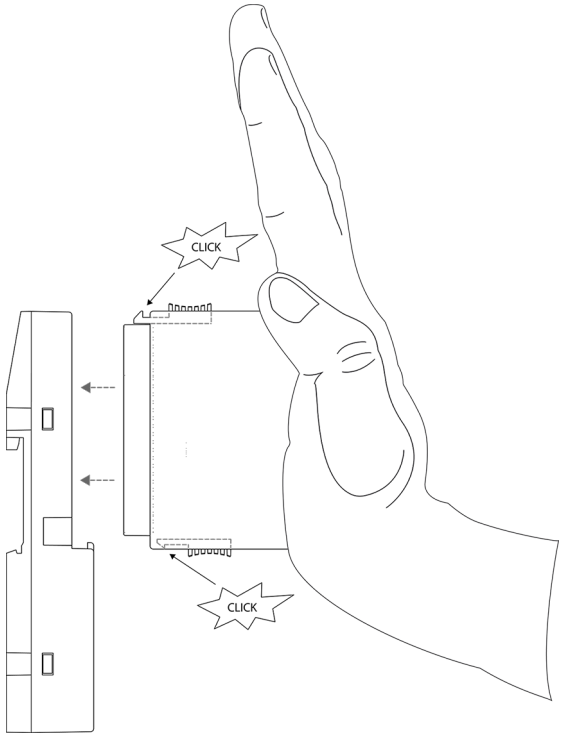
NOTICE!

Hot swap

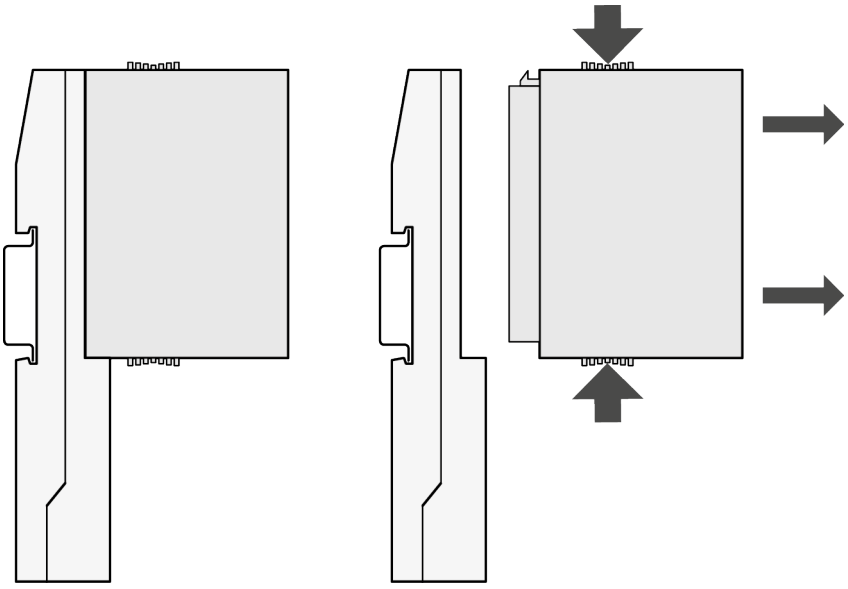
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

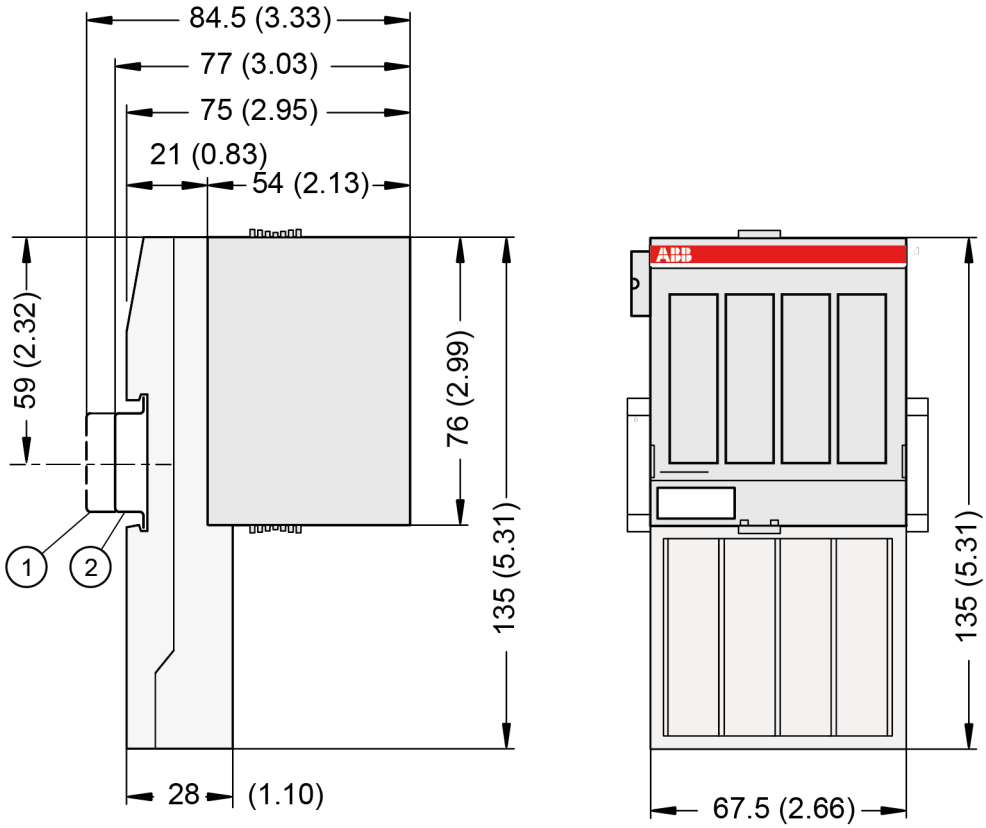
29.1 Assembly



29.2 Disassembly



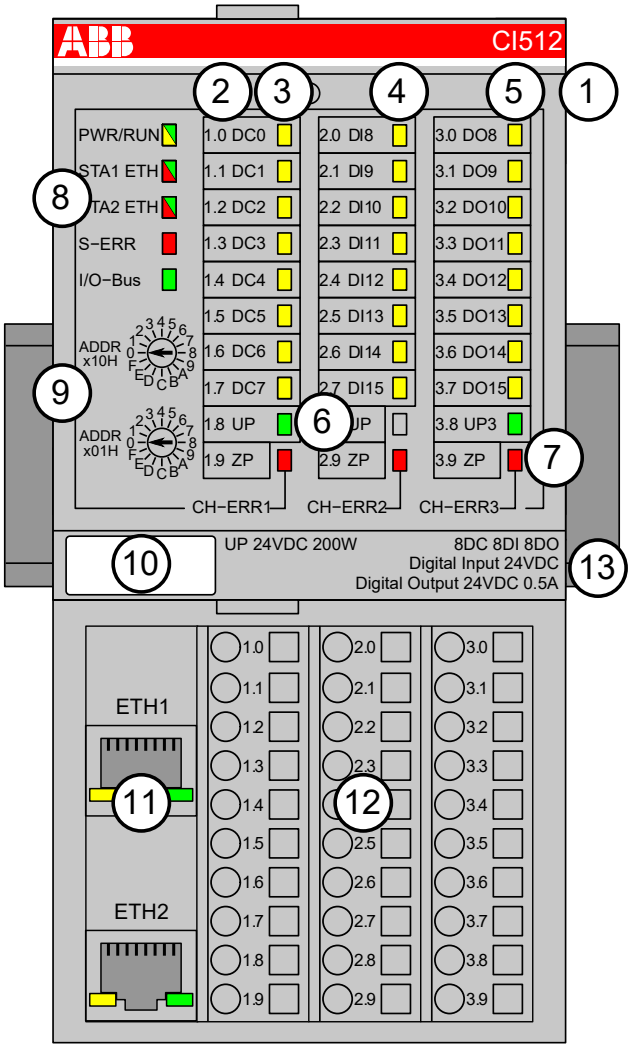
29.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

> *The dimensions are in mm and in brackets in inch.*

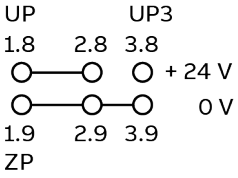
29.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the digital configurable inputs/outputs (DC0 ... DC7)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 System LEDs: PWR/RUN, NET, DC, S-ERR, I/O-Bus
9 2 rotary switches (reserved for future extensions)
10 Label
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail

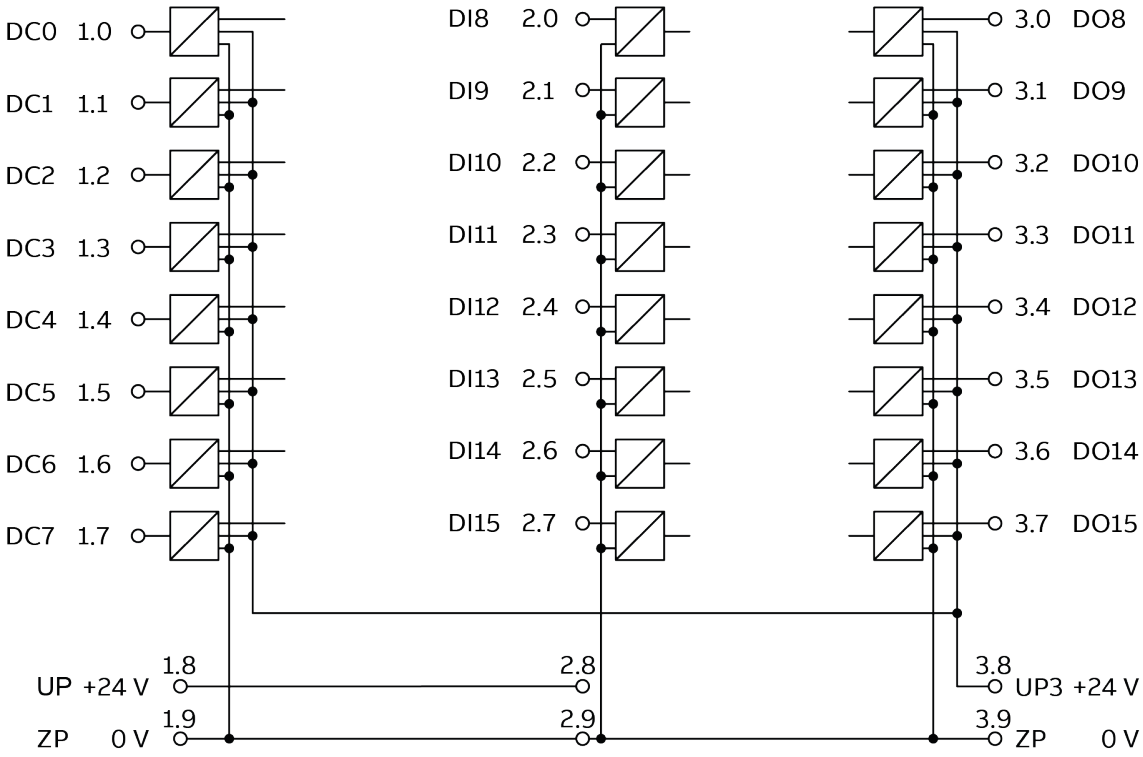
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

29.4.1 Process supply voltage

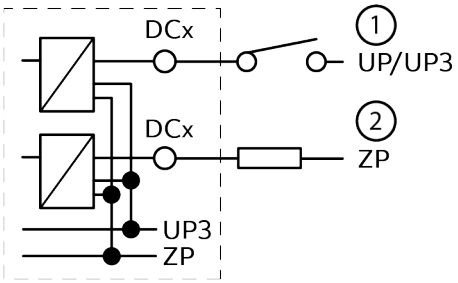


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

29.4.2 Inputs/Outputs



Example input or output



1 Example of connection as an input
2 Example of connection as an output

Example digital input

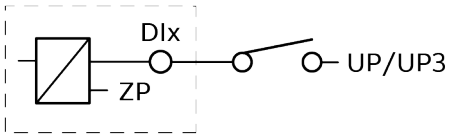


Fig. 44: Example of connection input DIx

Example digital output

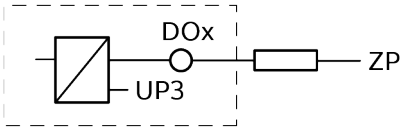


Fig. 45: Example of connection output DOx

30 CI521-MODTCP(-XC)

- CI521-MODTCP
- CI521-MODTCP-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

NOTICE!

Hot swap

Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

NOTICE!

Risk of device damage!

– I/O modules with a device index **above** F0 can be hot-swapped. When I/O modules **below** F0 are inserted or removed from the terminal unit in a powered system the I/O modules can be damaged.

  Before hot swapping a device, check the device index and ensure that the modules meet the requirements. *Table 3 “Allowed device indexes for I/O modules for hot swapping” on page 203*

– Terminal units that support hot swapping of I/O modules have the appendix TU5xx**-H**.

– Hot swap is not supported by AC500-eCo CPU!

The following I/O bus masters support hot swapping of attached I/O modules:

– Communication interface modules CI5xx as of index F0.

– Processor modules PM56xx-2ETH with firmware version as of V3.2.0.

Table 3: Allowed device indexes for I/O modules for hot swapping

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
AC522(-XC)	F0	F0
AI523 (-XC)	F0	D2
AI531	F0	D4
AI531-XC	F0	D2
AI561	hot swap is not supported	B2
AI562	hot swap is not supported	B2
AI563	hot swap is not supported	B3
AI564	hot swap is not supported	A0
AI565	hot swap is not supported	A0
AI568	hot swap is not supported	A0
AI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
AO522 (-XC)	F0	F0
AO523 (-XC)	F0	D2
AO561	hot swap is not supported	B2
AO562	hot swap is not supported	A0
AO568	hot swap is not supported	A0
AX521 (-XC)	F0	D2
AX522 (-XC)	F0	D2
AX561	hot swap is not supported	B2
CD522 (-XC)	hot swap is not supported	D1
DA501 (-XC)	F0	D2
DA502 (-XC)	F0	F0
DC522 (-XC)	F0	D2
DC523 (-XC)	F0	D2

I/O module	Minimum device index for hot swapping on a hot swap terminal unit	Minimum device index for use in a mixed configuration with hot-swappable devices
DC532 (-XC)	F0	D2
DC562	hot swap is not supported	A2
DI524 (-XC)	F0	D2
DI561	hot swap is not supported	B2
DI562	hot swap is not supported	B2
DI571	hot swap is not supported	B2
DI572	hot swap is not supported	A1
DI581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
DO524 (-XC)	F0	A3
DO526	F0	A2
DO526-XC	F0	A0
DO561	hot swap is not supported	B2
DO562	hot swap is not supported	A2
DO571	hot swap is not supported	B3
DO572	hot swap is not supported	B2
DO573	hot swap is not supported	A1
DX522 (-XC)	F0	D2
DX531	F0	D2
DX561	hot swap is not supported	B2
DX571	hot swap is not supported	B3
DX581-S (-XC)	hot swap is not supported	must not be used in a configuration that includes a hot swap terminal unit
FM562	F0	A1
FM565	hot swap is not supported	A0
FM566	hot swap is not supported	A0

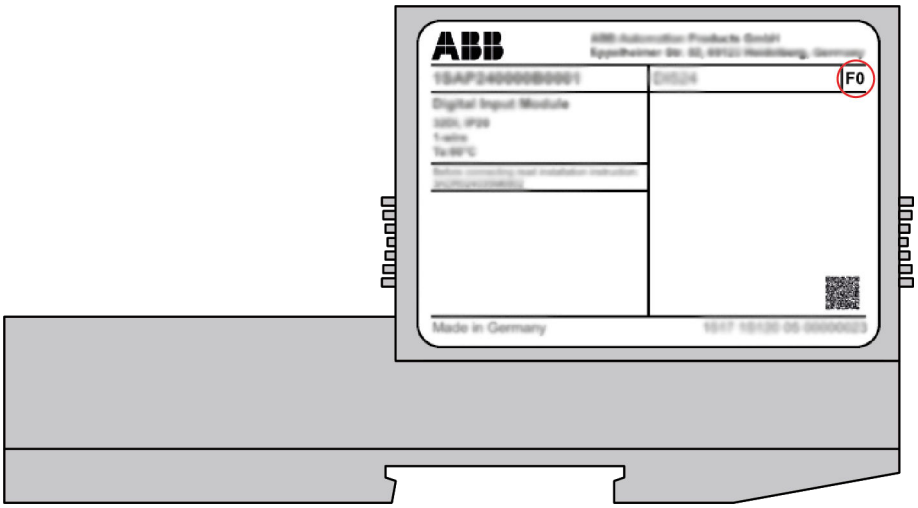


Fig. 46: The index of the module is in the right corner of the label.

WARNING!

Risk of explosion or fire in hazardous environments during hot swapping!

Hot swap must not be performed in flammable environments to avoid life-threatening injury and property damage resulting from fire or explosion.

WARNING!

Electric shock due to negligent behavior during hot swapping!

To avoid electric shock, do the following.

- Make sure the following conditions apply:
  - Digital outputs are not under load.
  - Input/output voltages above safety extra low voltage/ protective extra low voltage (SELV/PELV) are switched off.
  - Modules are fully interlocked with the terminal unit with both snap-fits engaged before switching on loads or input/output voltage.
- Never touch exposed contacts (dangerous voltages).
- Stay away from electrical contacts to avoid arc discharge.
- Do not operate a mechanical installation improperly.

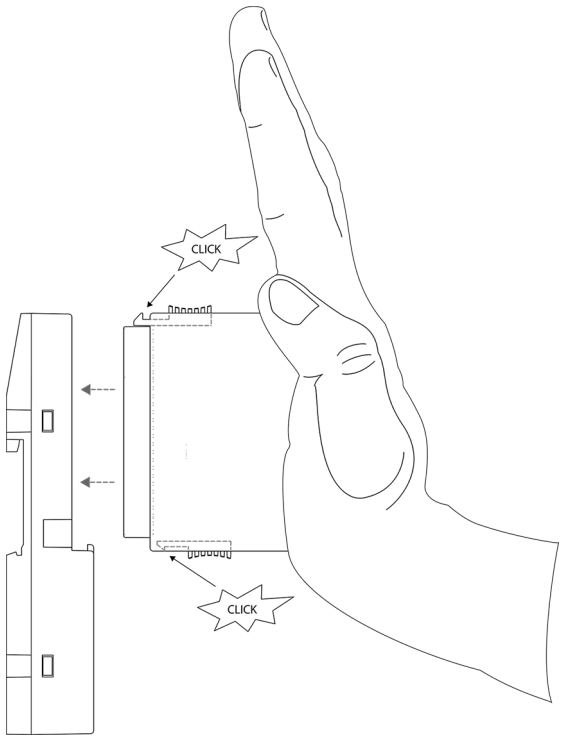
NOTICE!

Risk of damage to I/O modules!

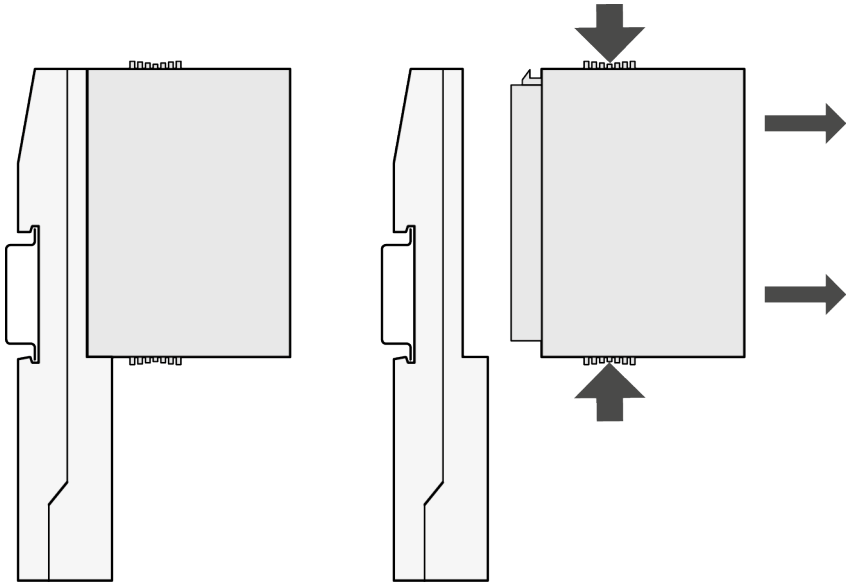
Hot swapping is only allowed for I/O modules.

Processor modules and communication interface modules must not be removed or inserted during operation.

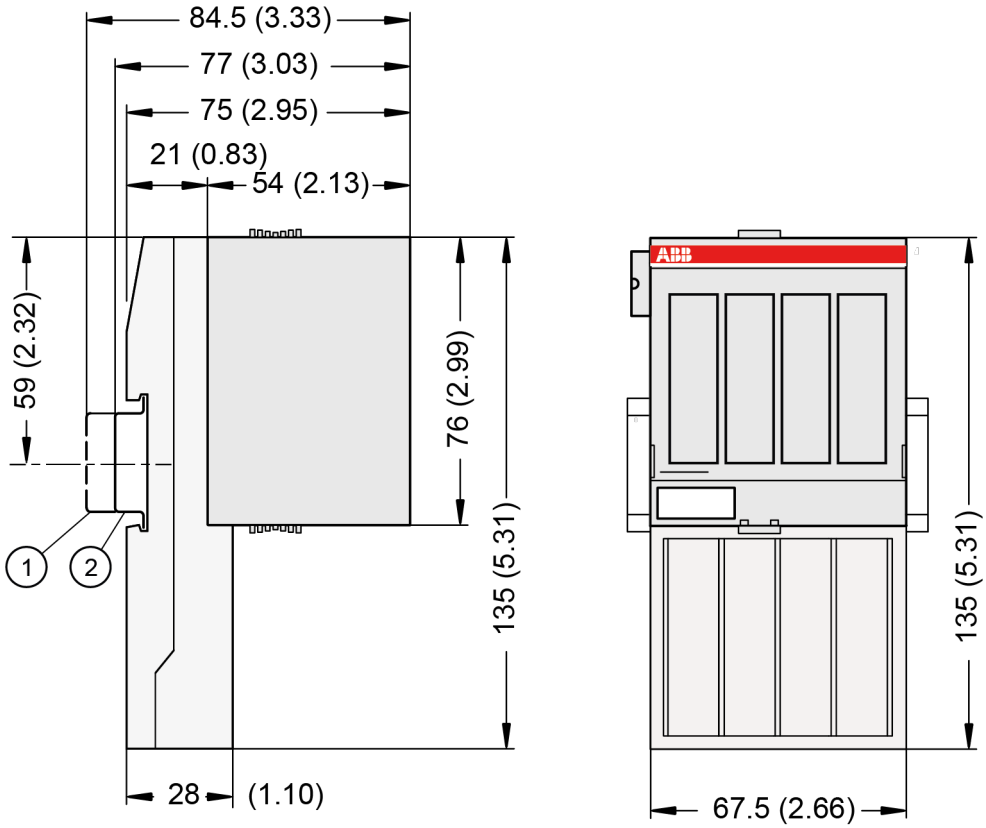
30.1 Assembly



30.2 Disassembly



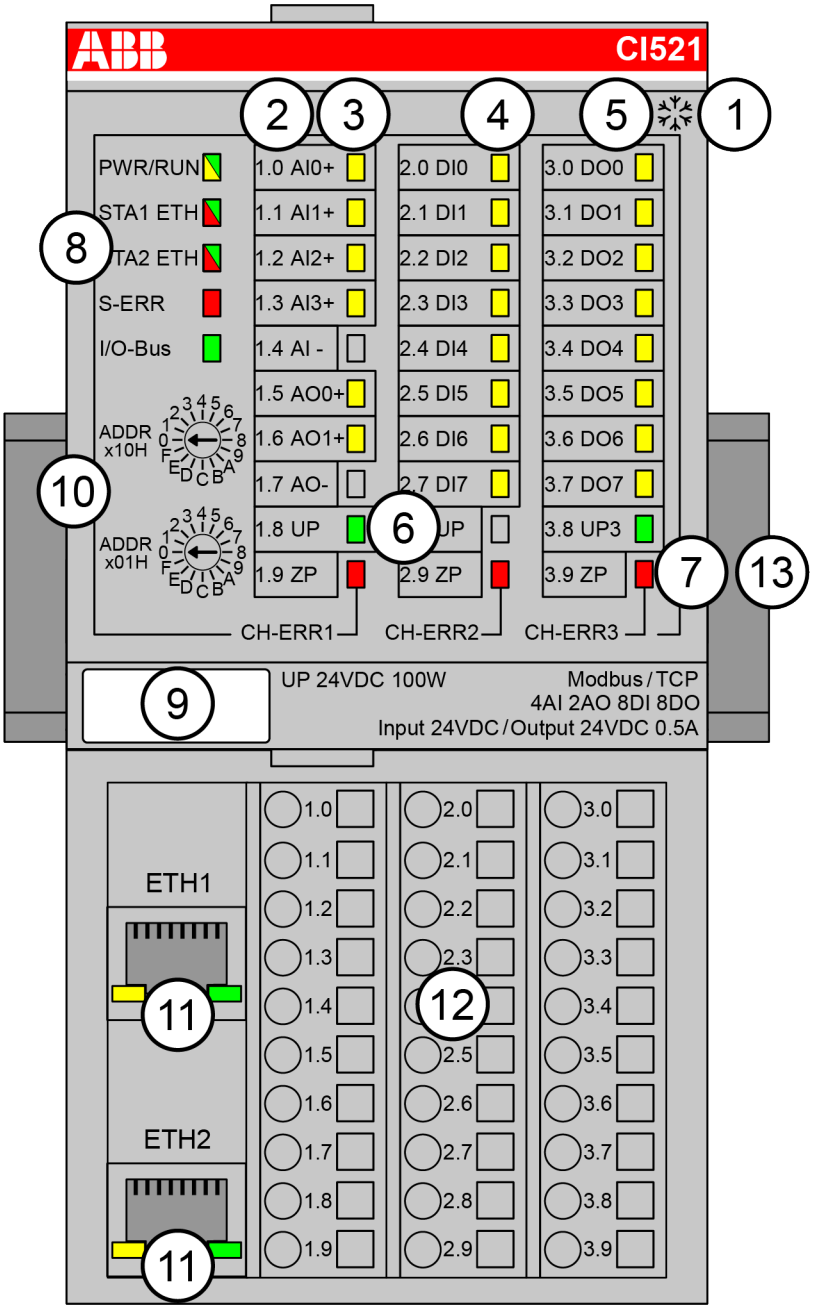
30.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

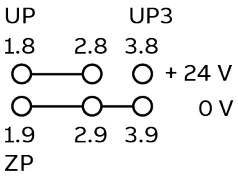
30.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 6 yellow LEDs to display the signal states of the analog inputs/outputs (AI0 ... AI3, AO0 ... AO1)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the IP address
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail
❄ Sign for XC version

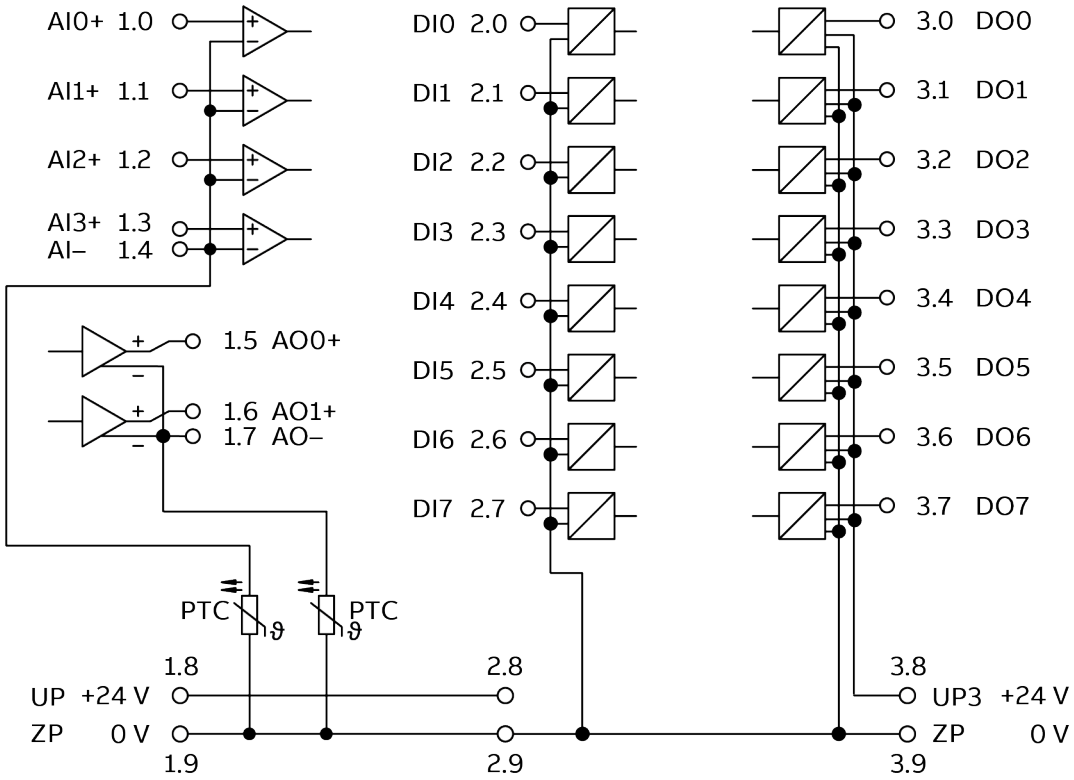
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

30.4.1 Process supply voltage

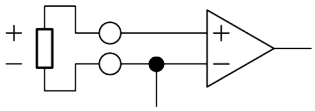


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

30.4.2 Inputs/Outputs



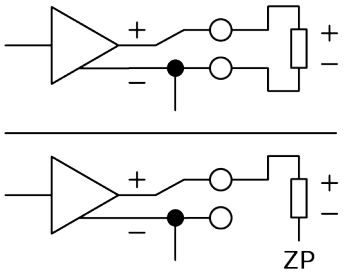
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 47: Example of connection input AIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 48: Example of connection output AOx

Example digital input

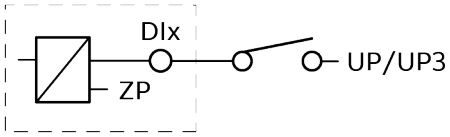


Fig. 49: Example of connection input DIx

Example digital output

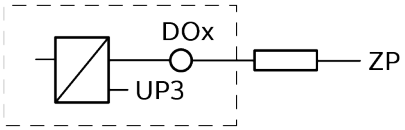


Fig. 50: Example of connection output DOx

31 CI522-MODTCP(-XC)

- CI522-MODTCP
- CI522-MODTCP-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

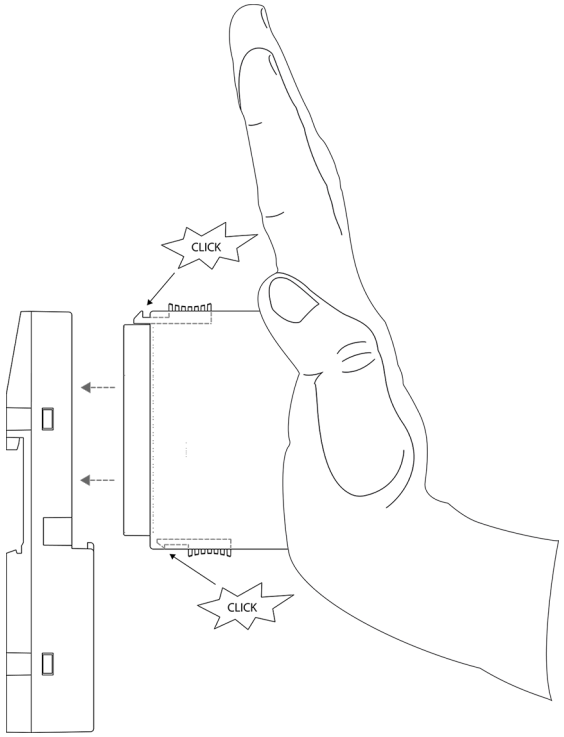
NOTICE!

Hot swap

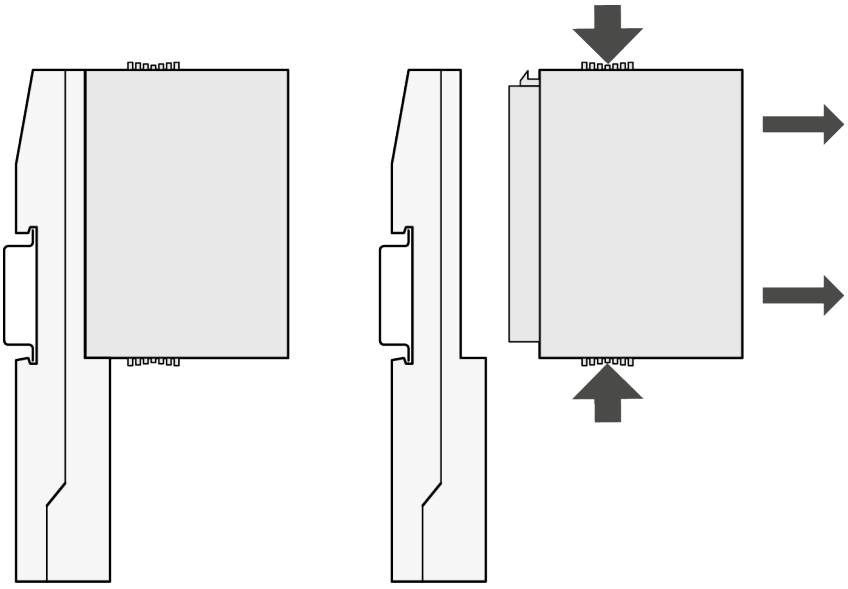
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

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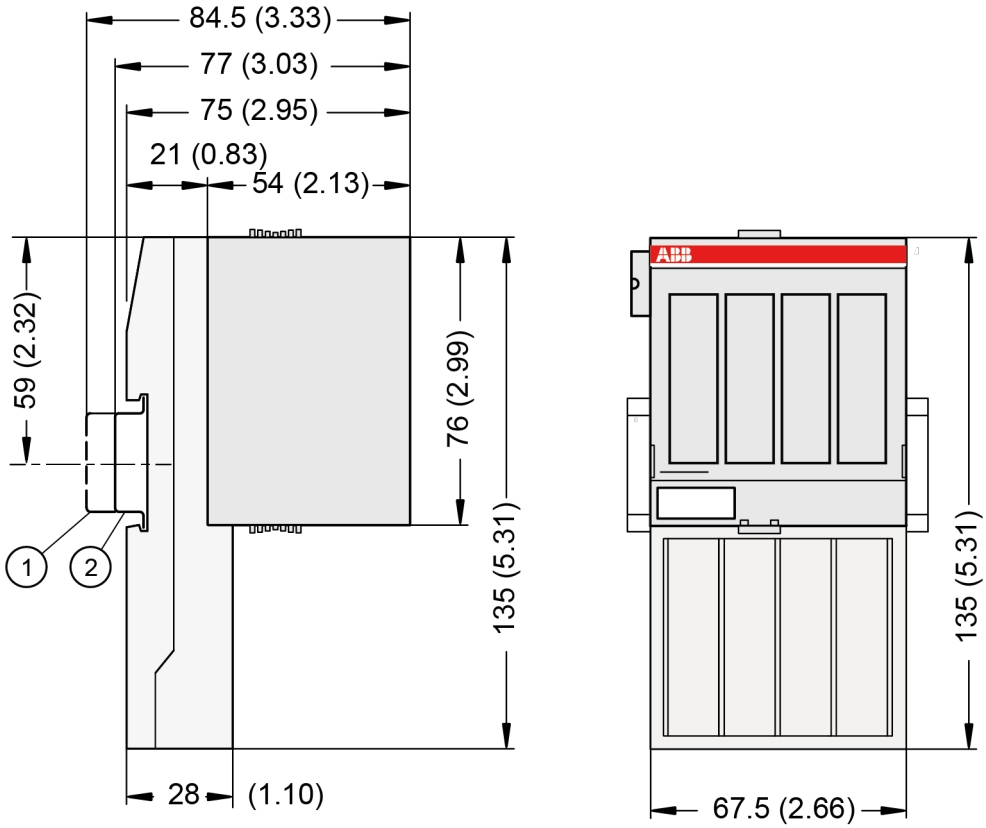
31.1 Assembly



31.2 Disassembly



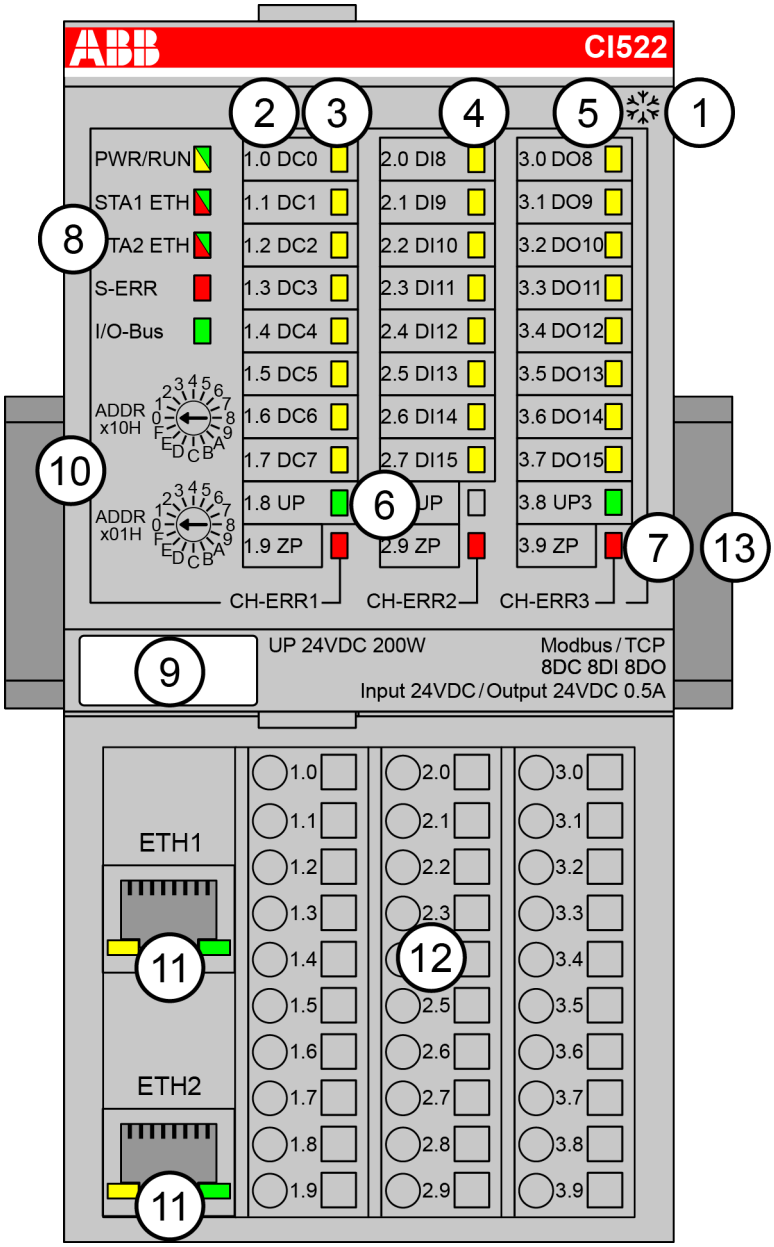
31.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

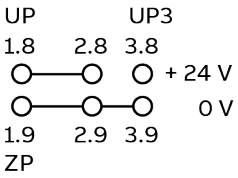
31.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the digital configurable inputs/outputs (DC0 ... DC7)
4 8 yellow LEDs to display the signal states of the digital inputs (DI8 ... DI15)
5 8 yellow LEDs to display the signal states of the digital outputs (DO8 ... DO15)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 ETH, STA2 ETH, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the IP address
11 Ethernet interfaces (ETH1, ETH2) on the terminal unit
12 Terminal unit
13 DIN rail
❄ Sign for XC version

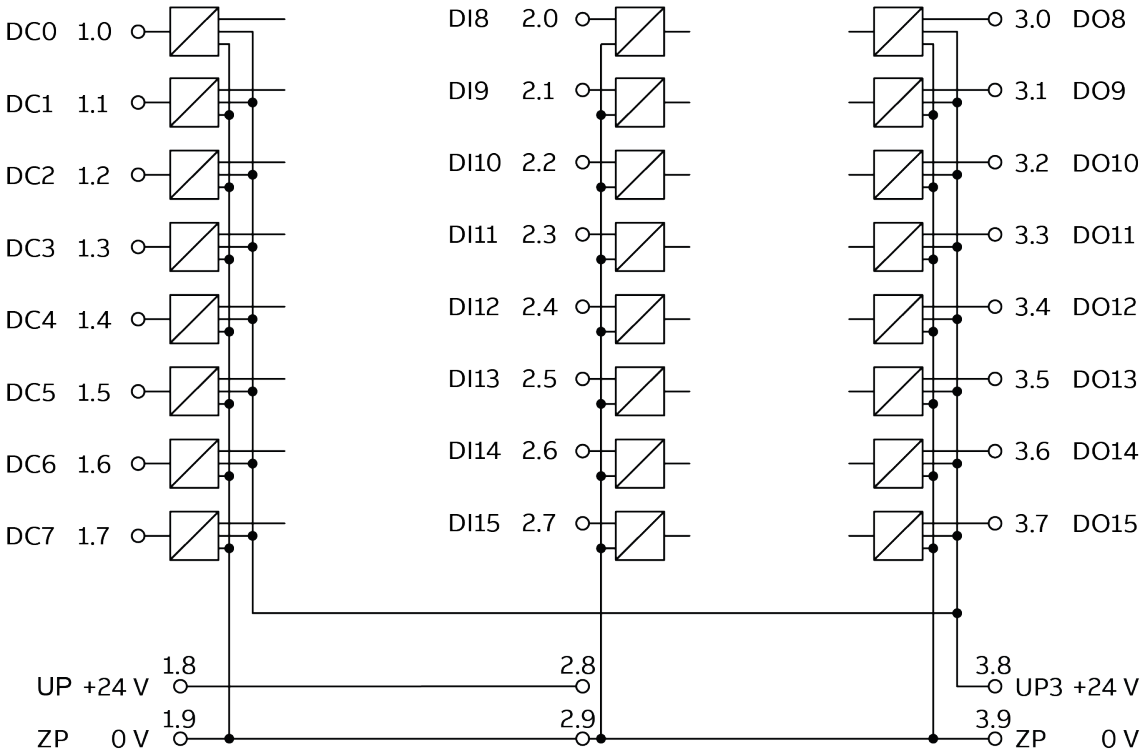
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

31.4.1 Process supply voltage

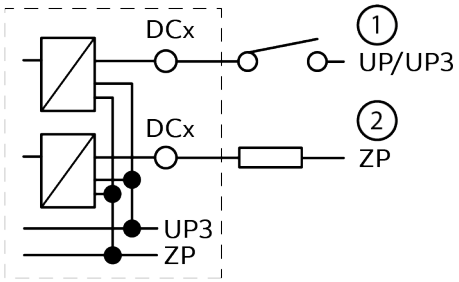


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

31.4.2 Inputs/Outputs



Example input or output



1 Example of connection as an input
2 Example of connection as an output

Example digital input

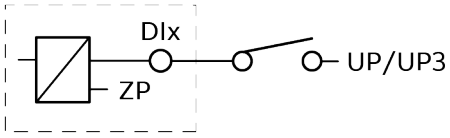


Fig. 51: Example of connection input DIx

Example digital output

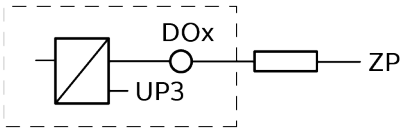


Fig. 52: Example of connection output DOx

32 CI541-DP(-XC)

- CI541-DP
- CI541-DP-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

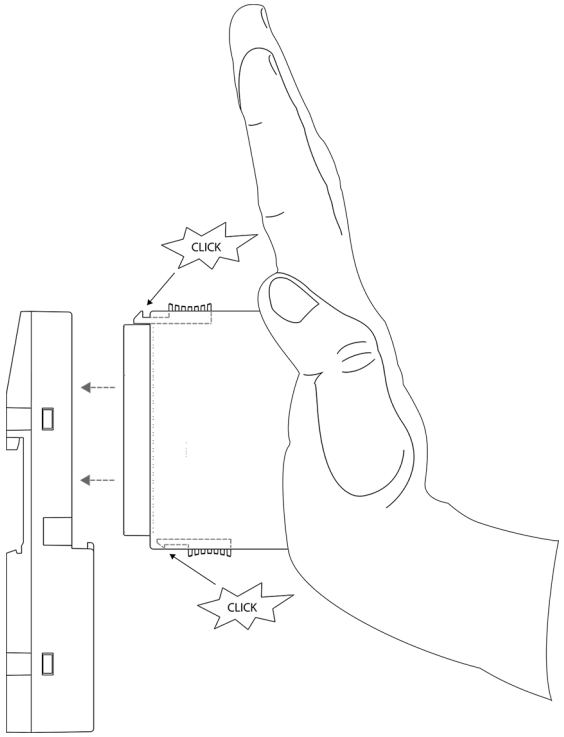
NOTICE!

Hot swap

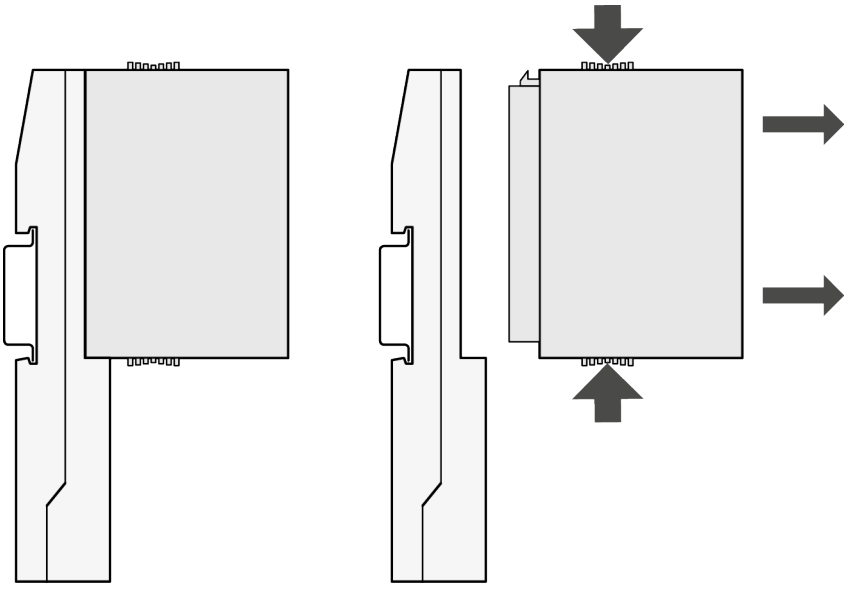
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

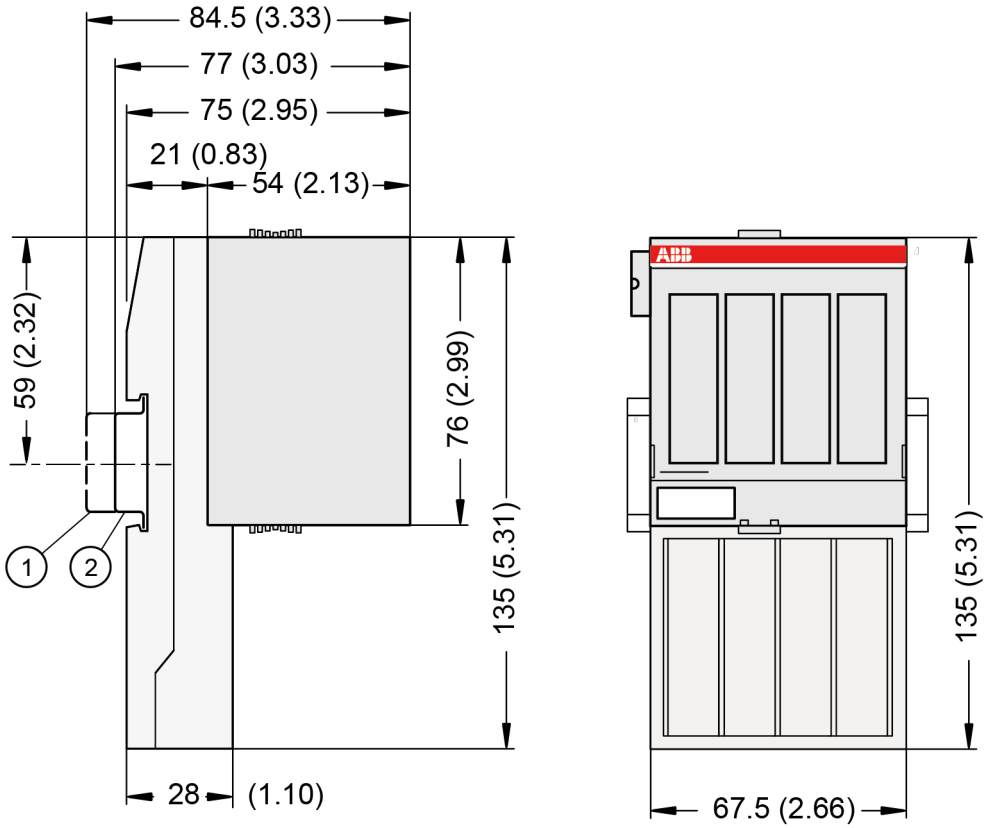
32.1 Assembly



32.2 Disassembly



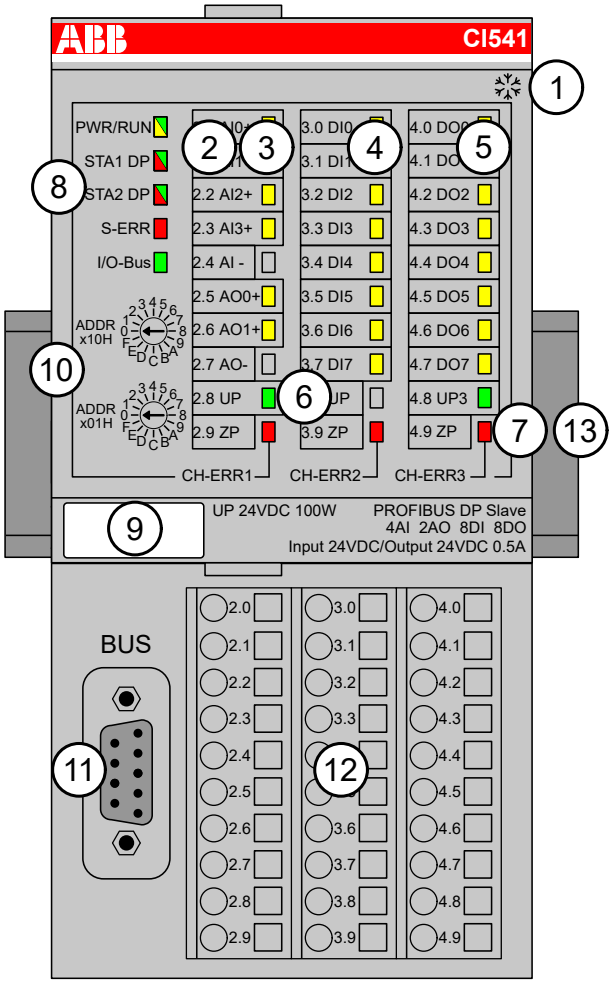
32.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

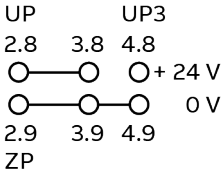
32.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 6 yellow LEDs to display the signal states of the analog inputs/outputs (AI0 ... AI3, AO0 ... AO1)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 DP, STA2 DP, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the PROFIBUS ID
11 9-pin D-SUB connector to connect the PROFIBUS DP signals
12 Terminal unit
13 DIN rail
❄ Sign for XC version

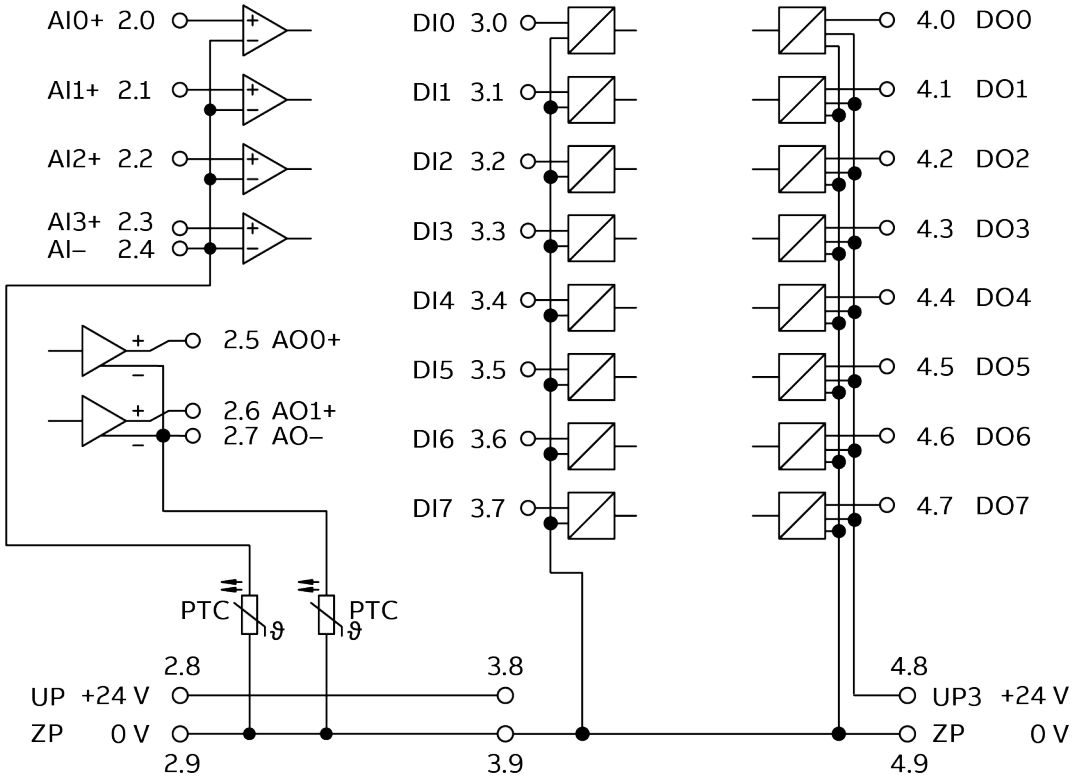
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

32.4.1 Process supply voltage

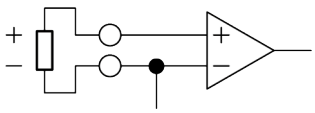


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

32.4.2 Inputs/Outputs



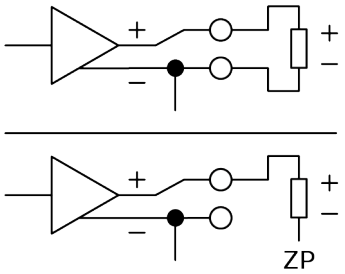
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 53: Example of connection input AIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 54: Example of connection output AOx

Example digital input

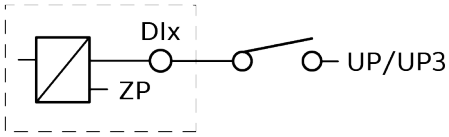


Fig. 55: Example of connection input DIx

Example digital output

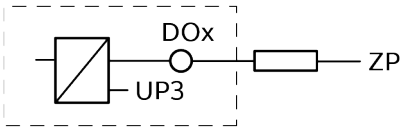
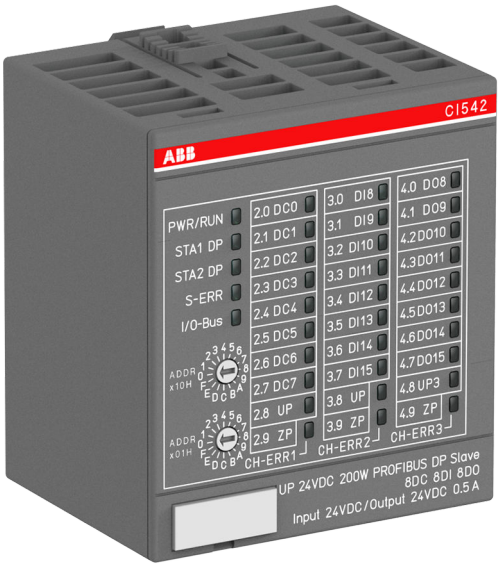


Fig. 56: Example of connection output DOx

33 CI542-DP(-XC)

- CI542-DP
- CI542-DP-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

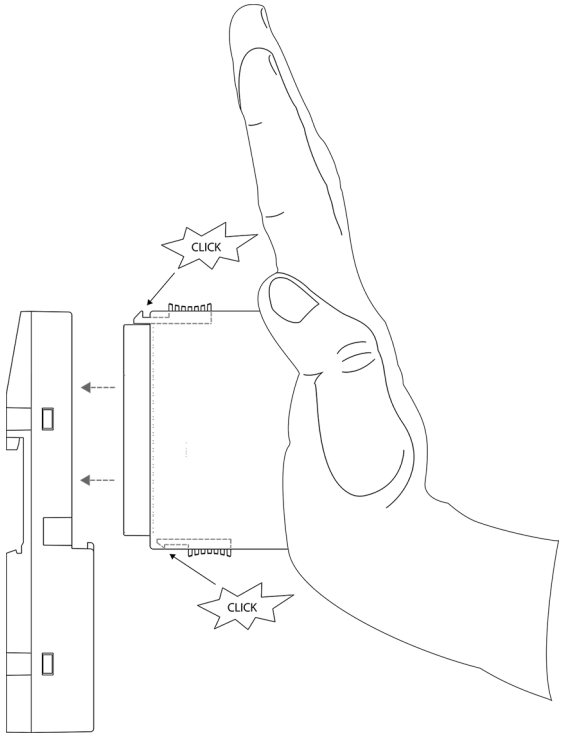
NOTICE!

Hot swap

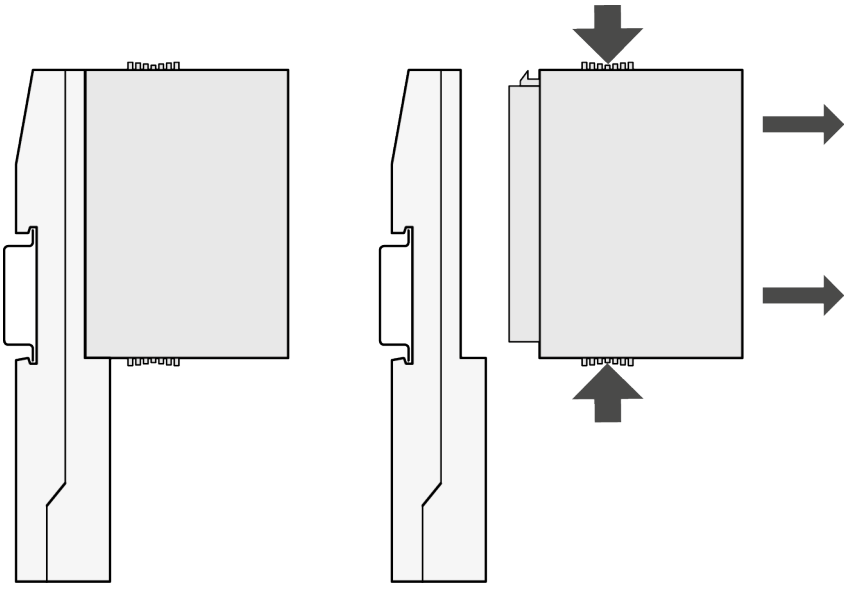
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

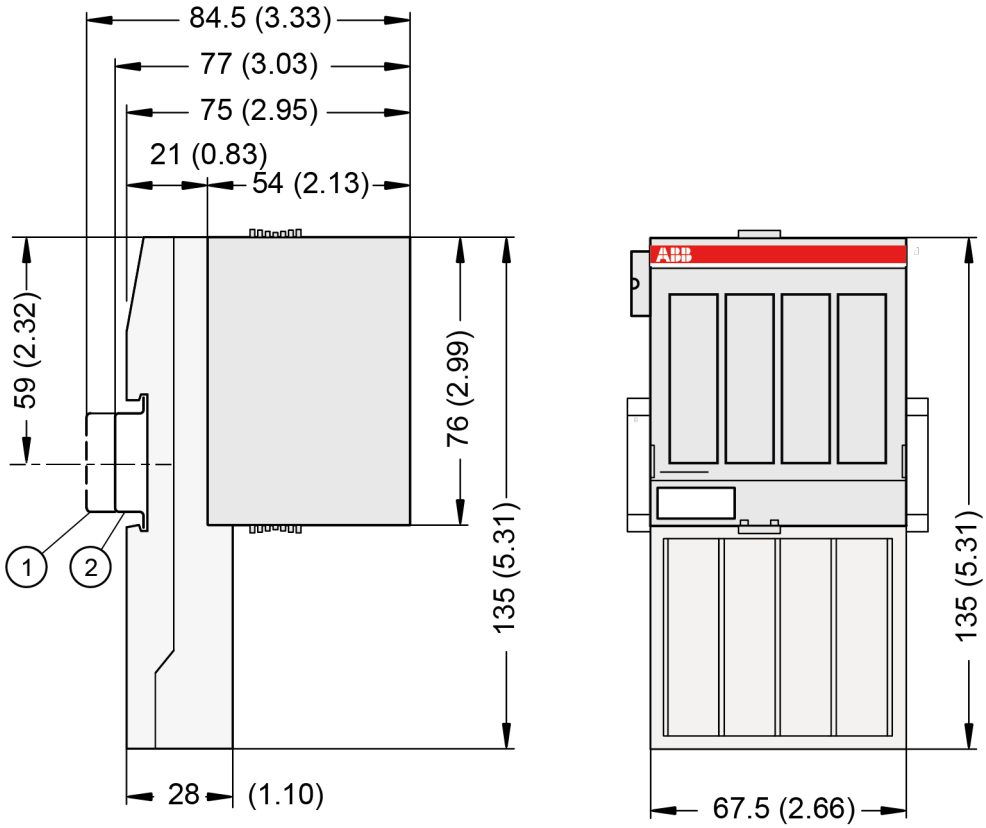
33.1 Assembly



33.2 Disassembly



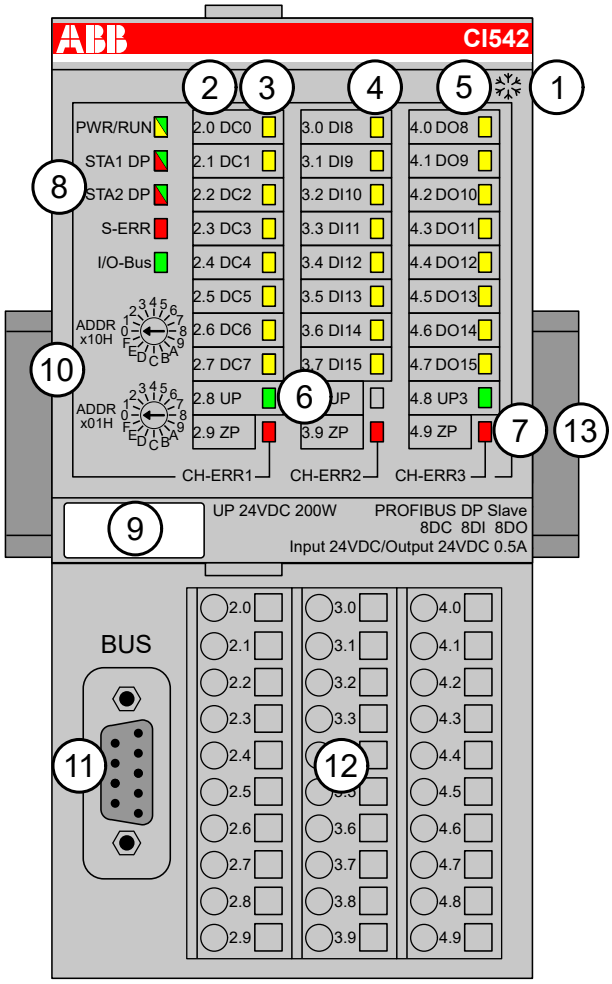
33.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

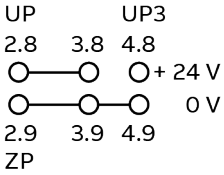
33.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the configurable digital inputs/outputs (DC0 ... DC7)
4 8 yellow LEDs to display the signal states of the digital inputs (DI8 ... DI15)
5 8 yellow LEDs to display the signal states of the digital outputs (DO8 ... DO15)
6 2 green LEDs to display the process supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 system LEDs: PWR/RUN, STA1 DP, STA2 DP, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the PROFIBUS ID
11 9-pin D-SUB connector to connect the PROFIBUS DP signals
12 Terminal unit
13 DIN rail
❄ Sign for XC version

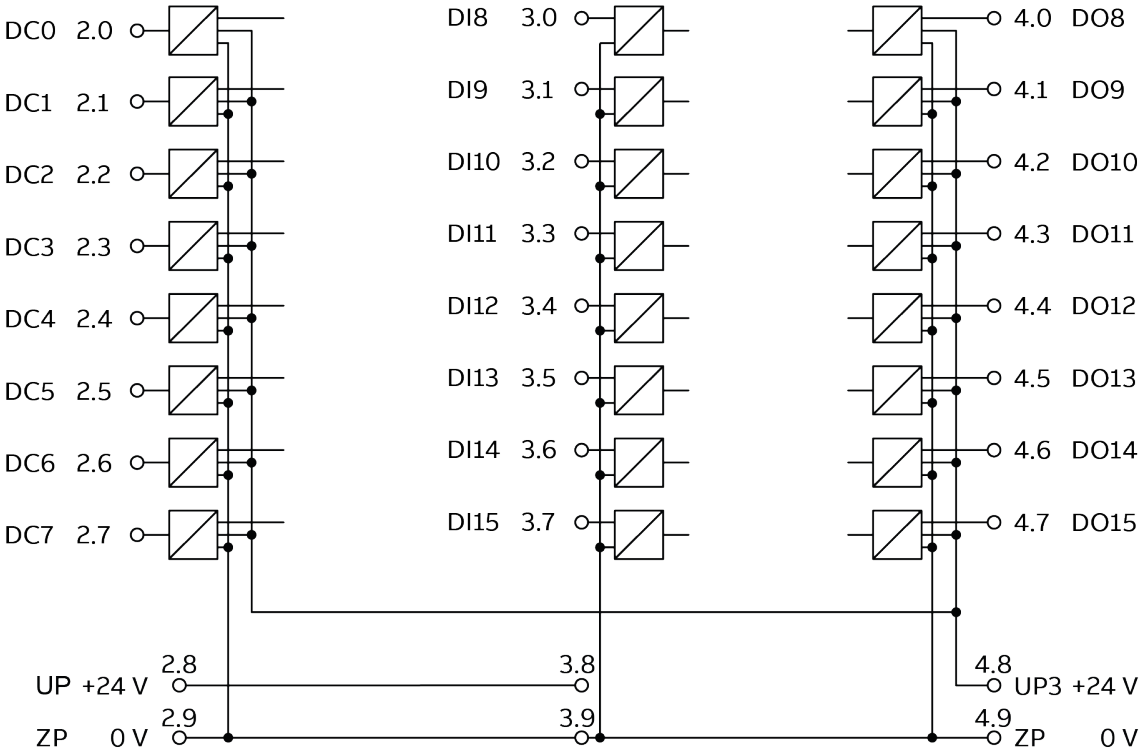
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

33.4.1 Process supply voltage

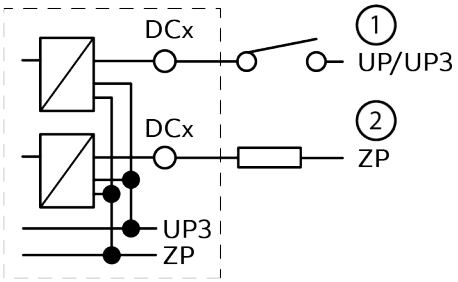


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

33.4.2 Inputs/Outputs



Example input or output



1 Example of connection as an input
2 Example of connection as an output

Example digital input

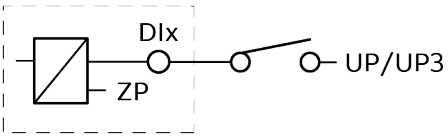


Fig. 57: Example of connection input DIx

Example digital output

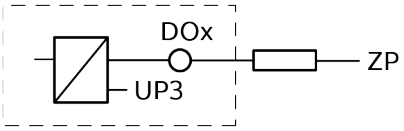


Fig. 58: Example of connection output DOx

34 CI581-CN(-XC)

- CI581-CN
- CI581-CN-XC



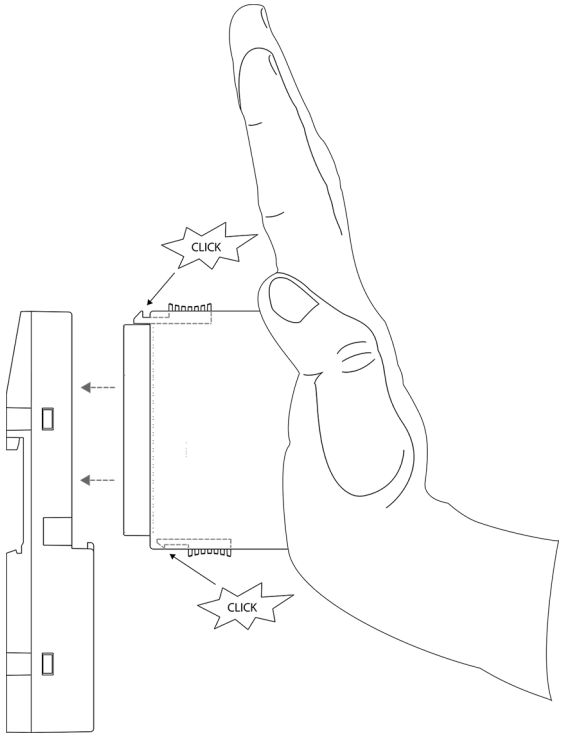
CAUTION!

Risk of injury and damaging the product!

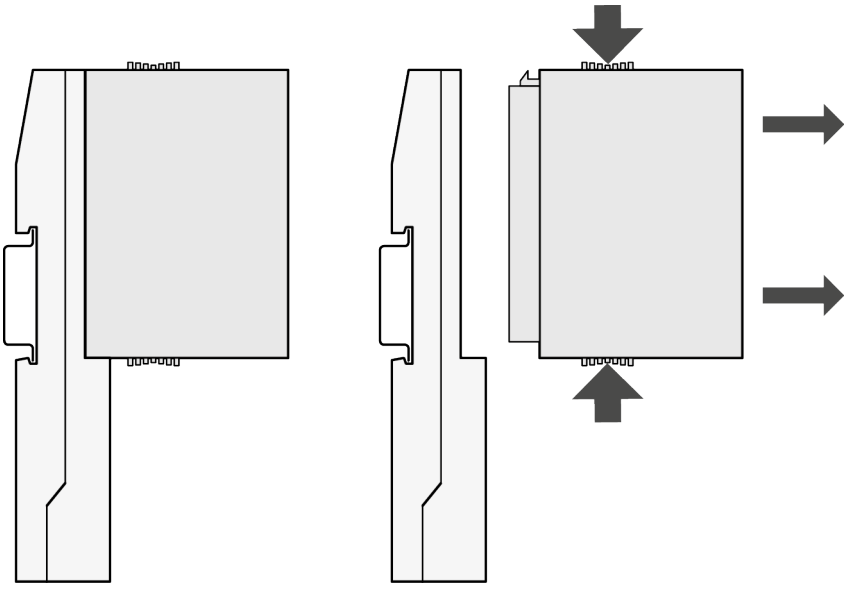
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

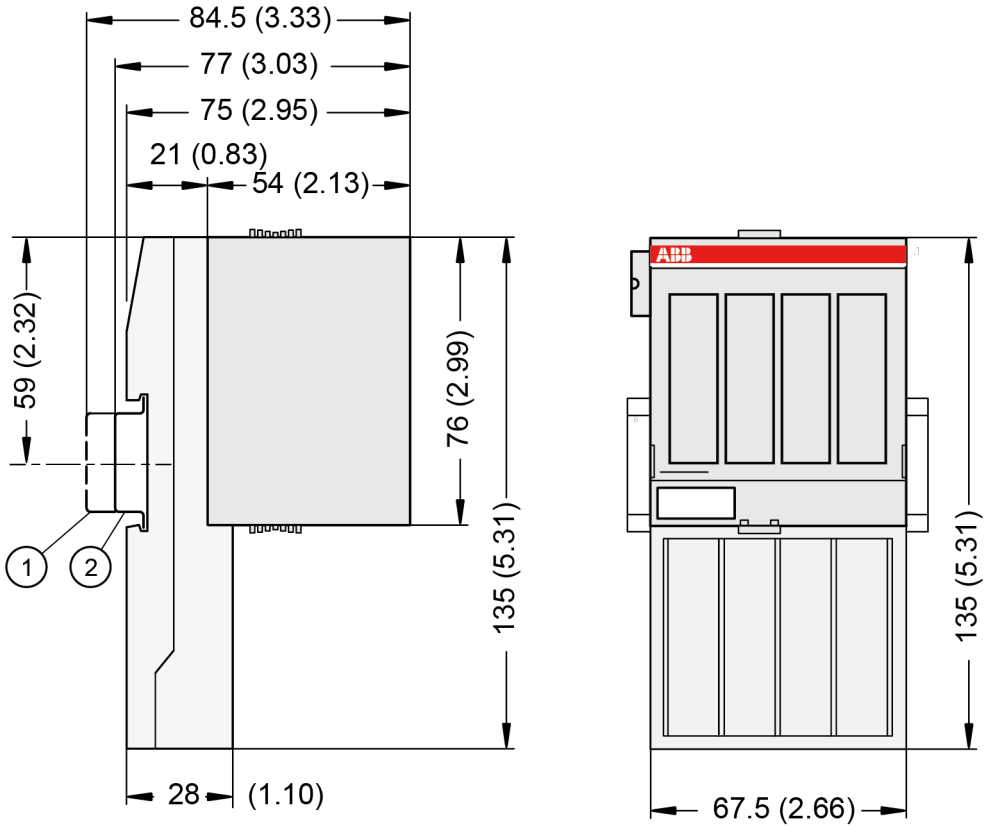
34.1 Assembly



34.2 Disassembly



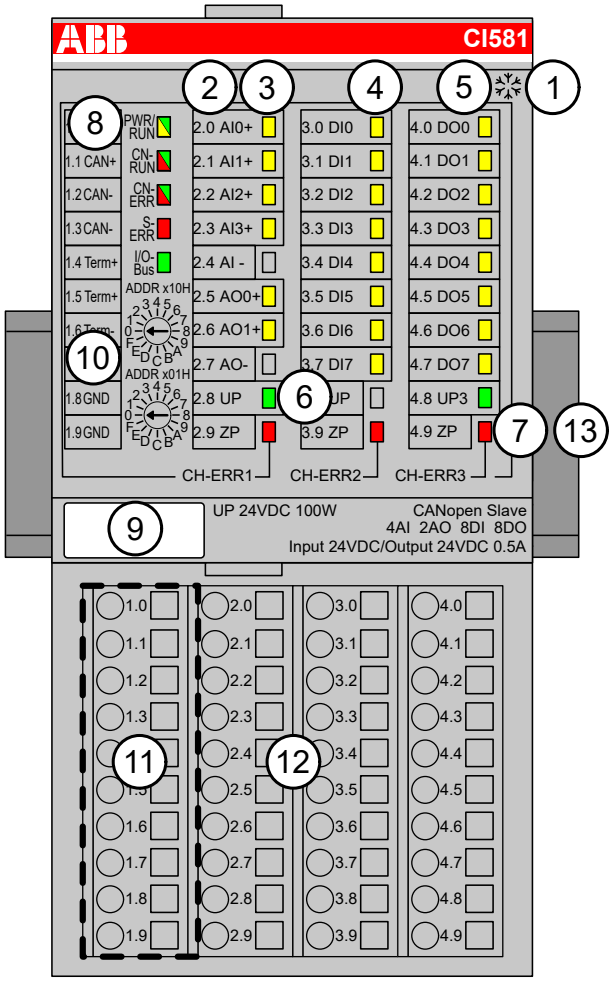
34.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

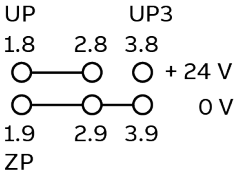
34.4 Connections



1 I/O bus
2 Allocation between terminal No. and signal name
3 6 yellow LEDs to display the signal states of the analog inputs/outputs (AI0 ... AI3, AO0 ... AO1)
4 8 yellow LEDs to display the signal states of the digital inputs (DI0 ... DI7)
5 8 yellow LEDs to display the signal states of the digital outputs (DO0 ... DO7)
6 2 green LEDs to display the supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 System LEDs: PWR/RUN, CN-RUN, CN-ERR, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the CANopen Node ID
11 10 terminals to connect the CANopen bus signals
12 Terminal unit
13 DIN rail
❄ Sign for XC version

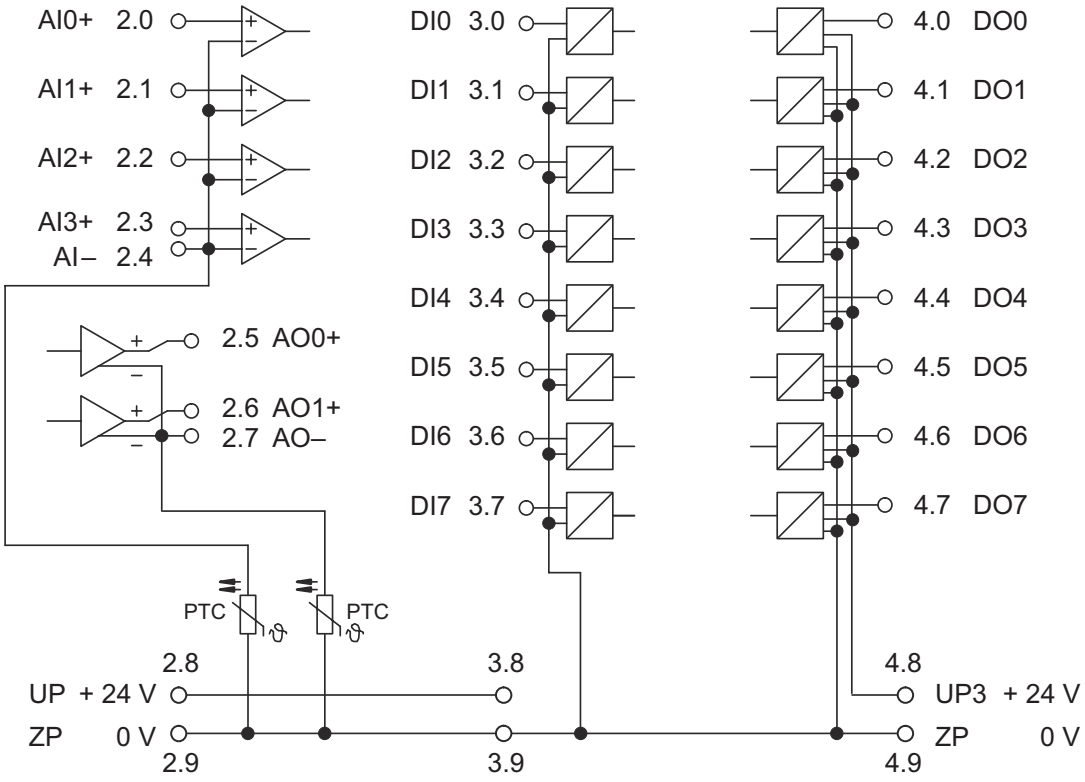
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

34.4.1 Process supply voltage

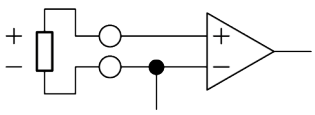


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

34.4.2 Inputs



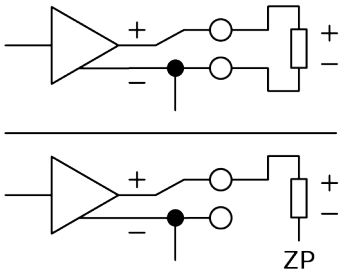
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 59: Example for connection input AIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 60: Example for connection output AOx

Example digital input

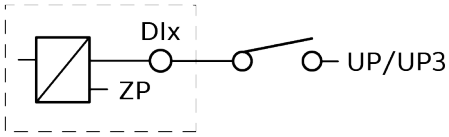


Fig. 61: Example for connection input DIx

Example digital output

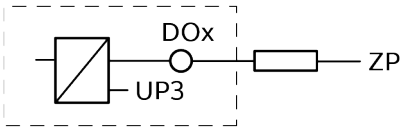


Fig. 62: Example for connection output DOx

35 CI582-CN(-XC)

- CI582-CN
- CI582-CN-XC



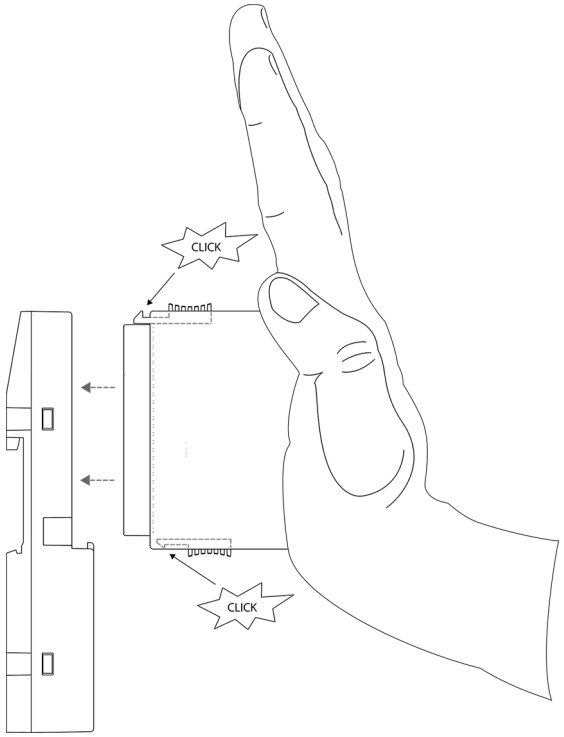
CAUTION!

Risk of injury and damaging the product!

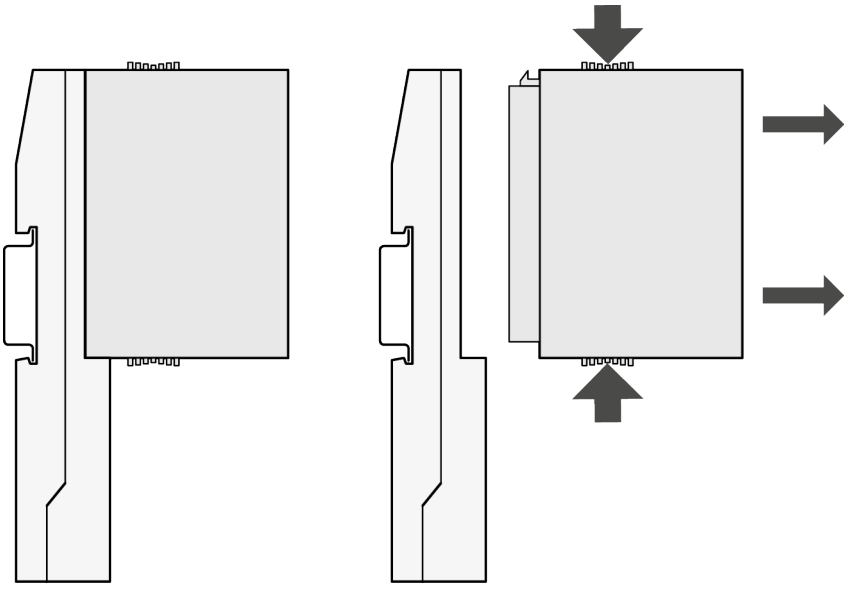
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

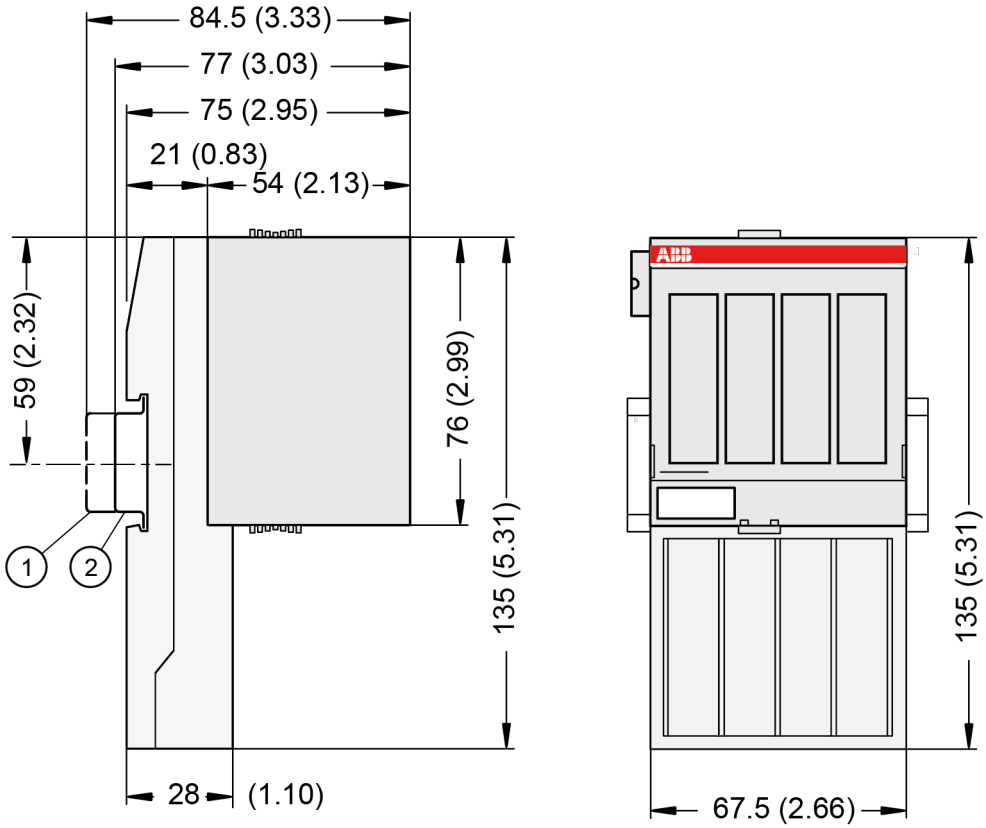
35.1 Assembly



35.2 Disassembly



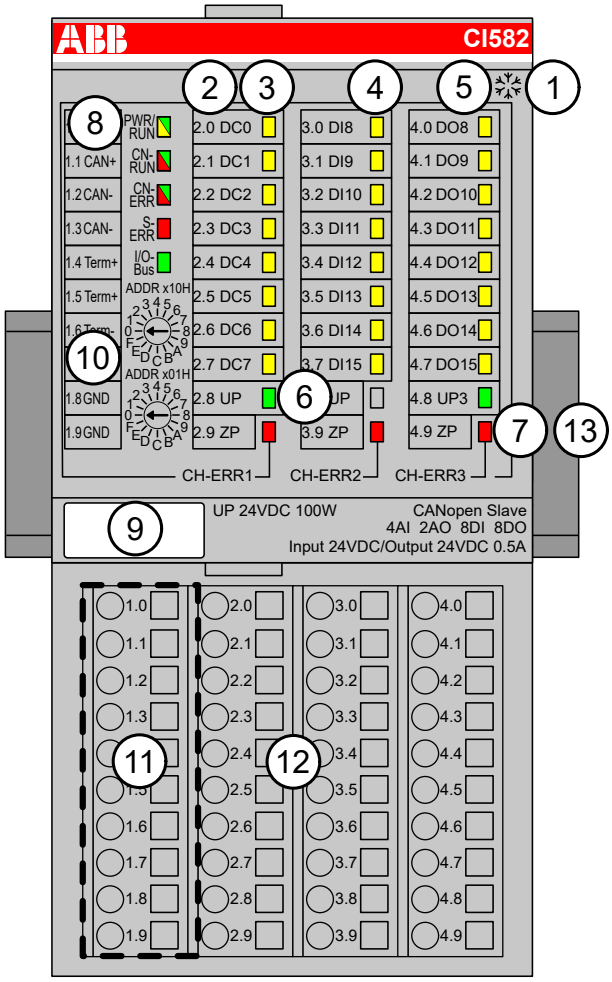
35.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

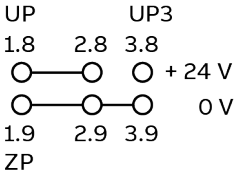
35.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the configurable digital inputs/outputs (DC0 ... DC7)
4 8 yellow LEDs to display the signal states of the digital inputs (DI8 ... DI15)
5 8 yellow LEDs to display the signal states of the digital outputs (DO8 ... DO15)
6 2 green LEDs to display the supply voltage UP and UP3
7 3 red LEDs to display errors (CH-ERR1, CH-ERR2, CH-ERR3)
8 5 System LEDs: PWR/RUN, CN-RUN, CN-ERR, S-ERR, I/O-Bus
9 Label
10 2 rotary switches for setting the CANopen node ID
11 10 terminals to connect the CANopen bus signals
12 Terminal unit
13 DIN rail
❄ Sign for XC version

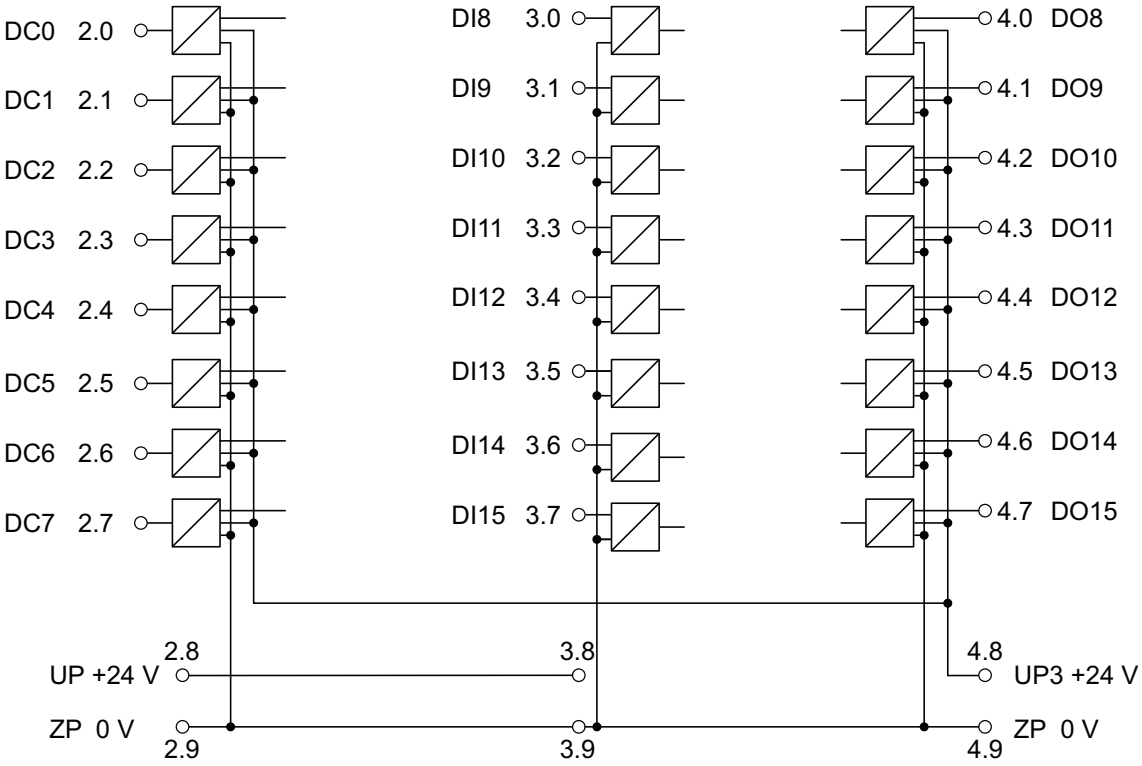
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

35.4.1 Process supply voltage

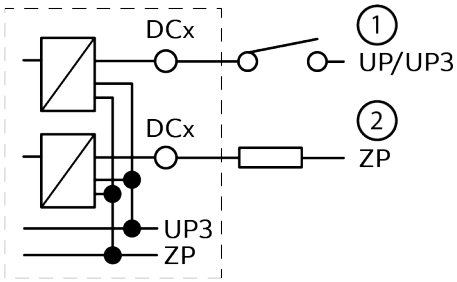


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

35.4.2 Inputs



Example input or output



1 Example for connection as an input
2 Example for connection as an output

Example digital input

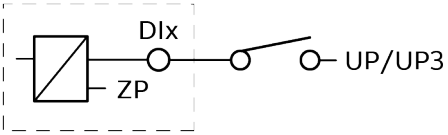


Fig. 63: Example for connection input DIx

Example digital output

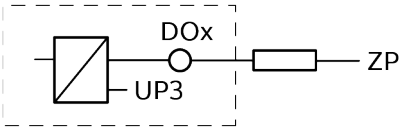
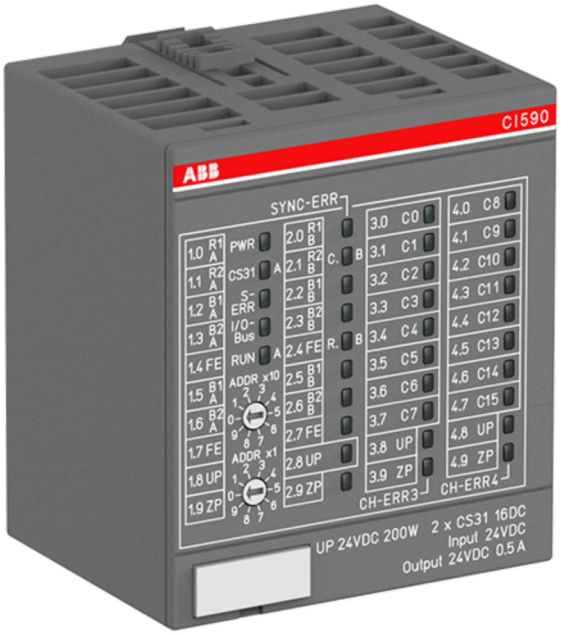


Fig. 64: Example for connection output DOx

36 CI590-CS31-HA(-XC)

- CI590-CS31-HA
- CI590-CS31-HA-XC



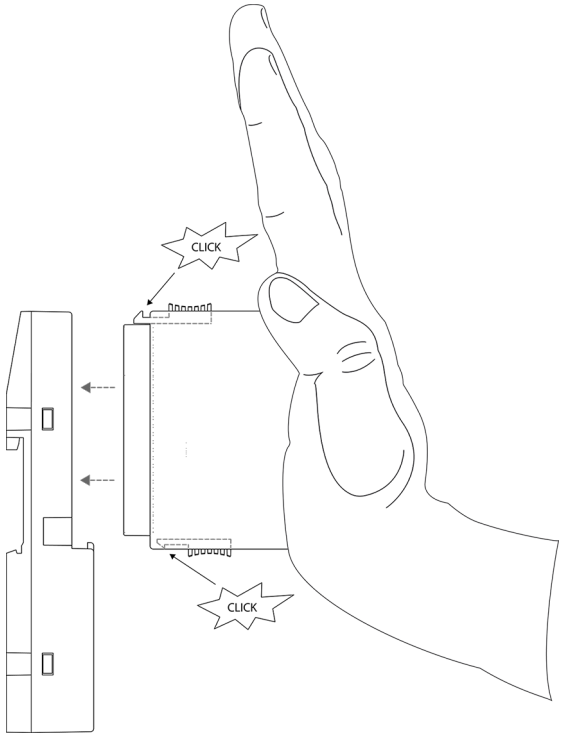
CAUTION!

Risk of injury and damaging the product!

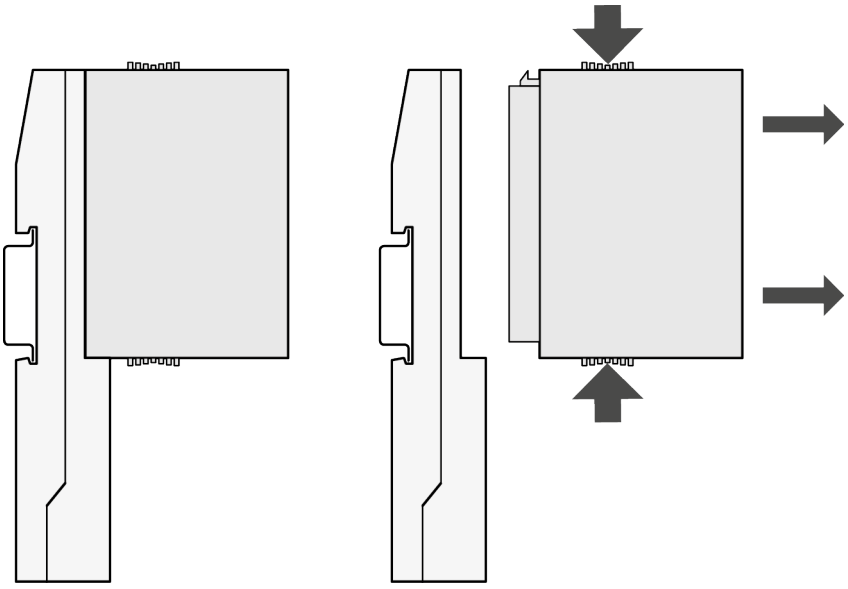
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

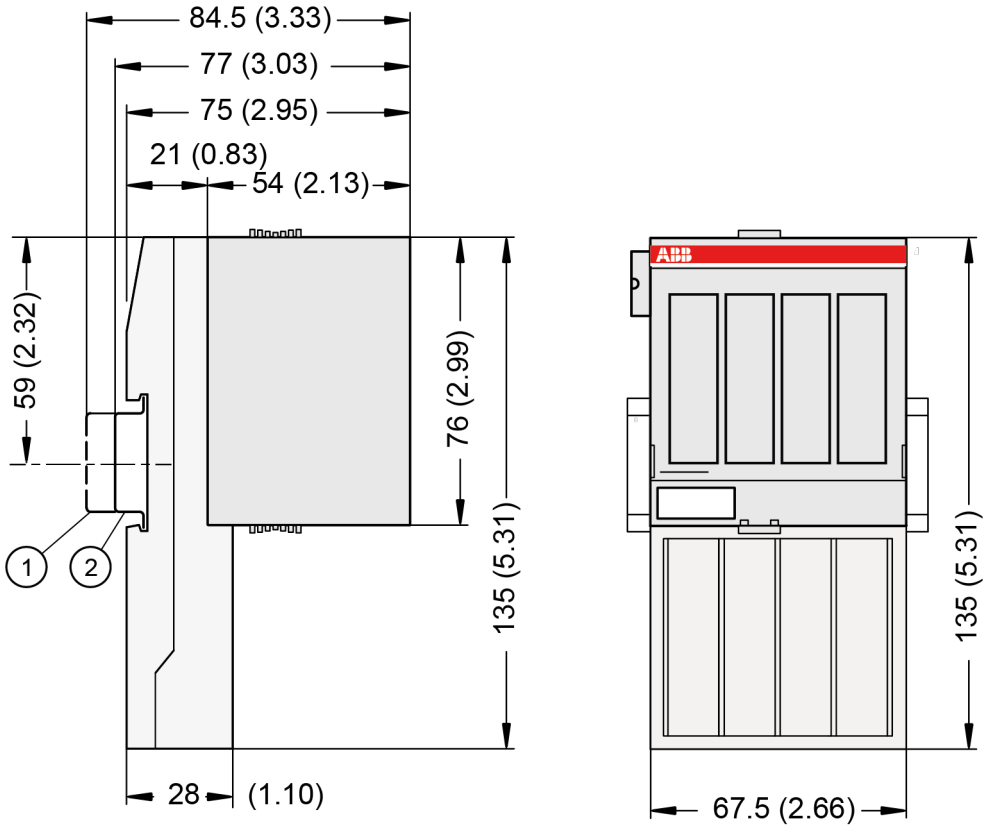
36.1 Assembly



36.2 Disassembly



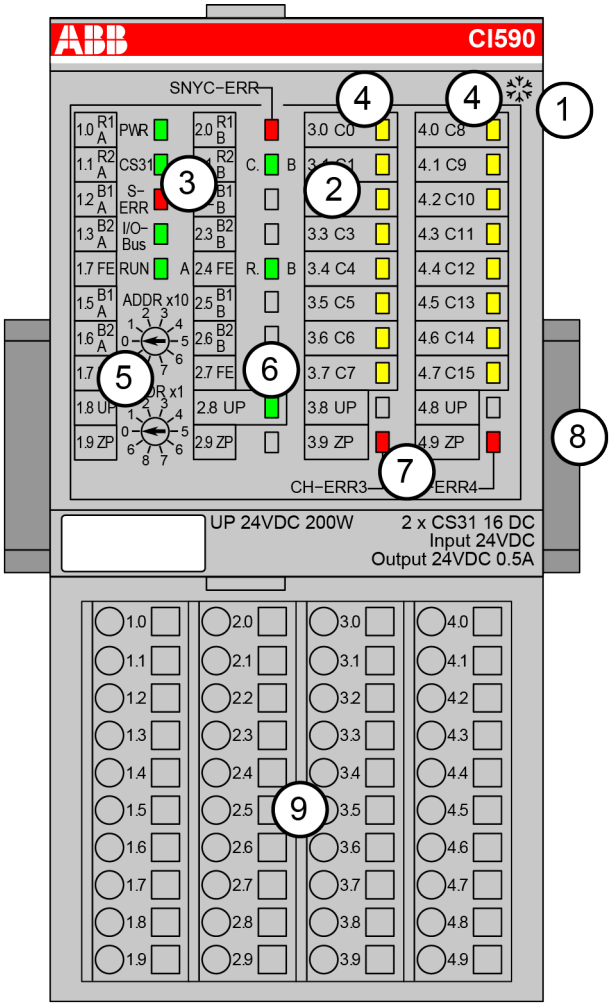
36.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

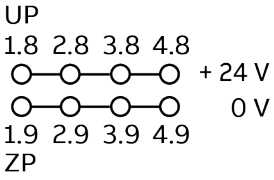
36.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 5 system LEDs
4 16 yellow LEDs to display the signal states of the configurable digital inputs/outputs C0 ... C15
5 2 rotary switches to set the module's address (00d ... 99d)
6 1 green LED to display the process voltage UP
7 2 red LEDs to display errors
8 DIN rail
9 Terminal unit
❄ Sign for XC version

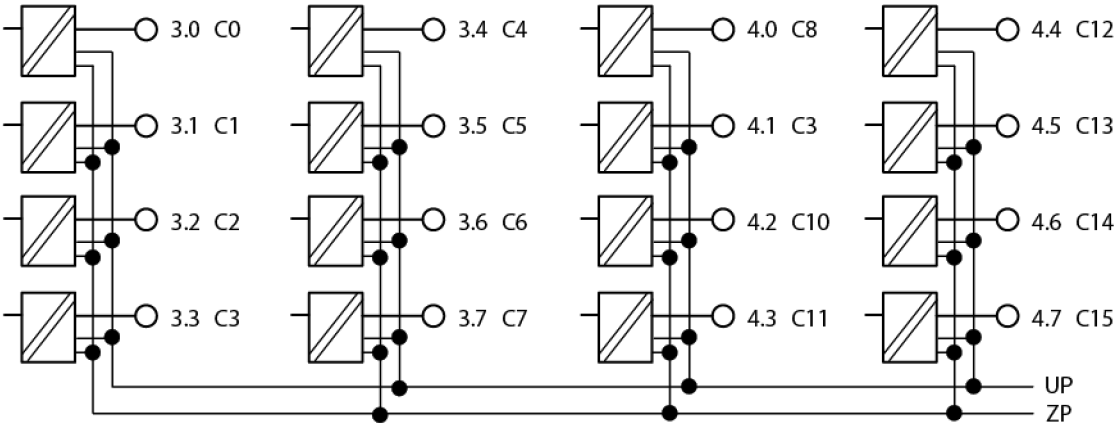
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

36.4.1 Process supply voltage

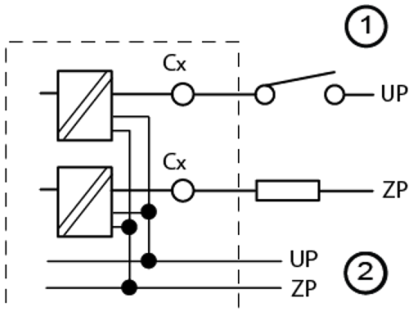


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

36.4.2 Inputs/Outputs



Example



1 Example of connection as an input
2 Example of connection as an output

37 CI592-CS31(-XC)

- CI592-CS31
- CI592-CS31-XC



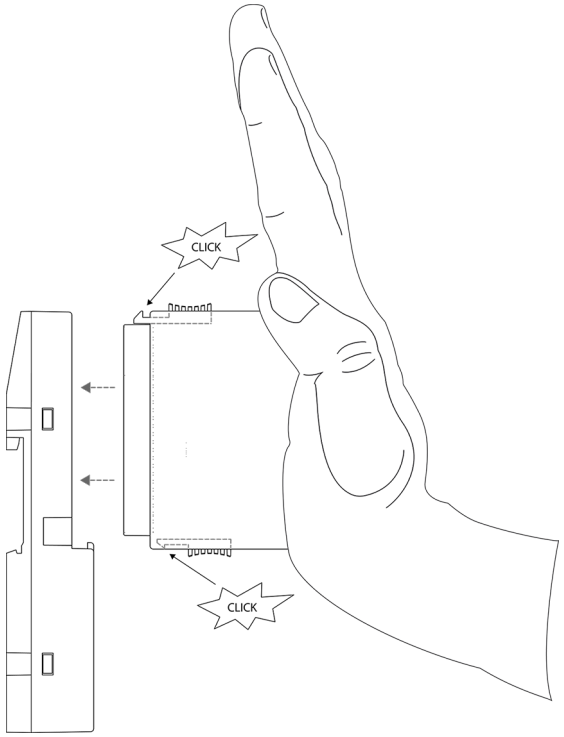
CAUTION!

Risk of injury and damaging the product!

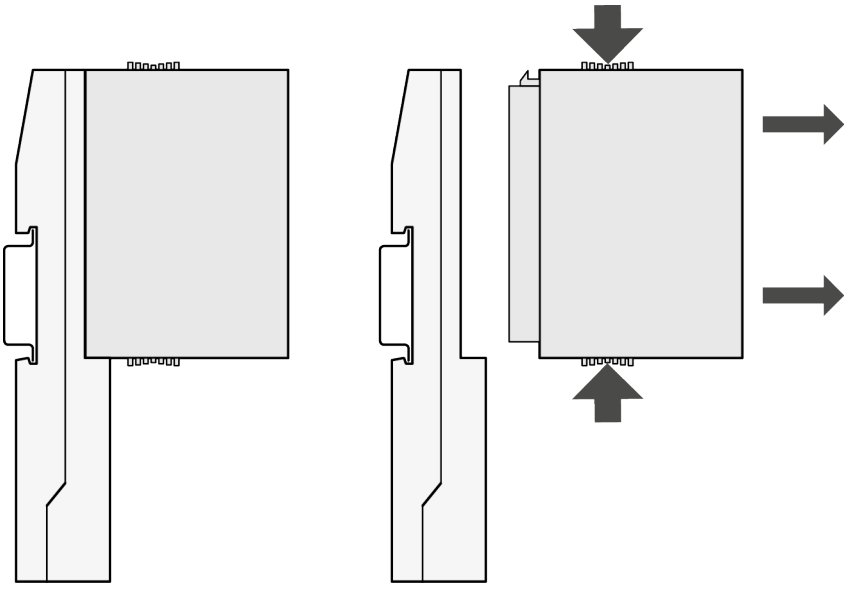
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

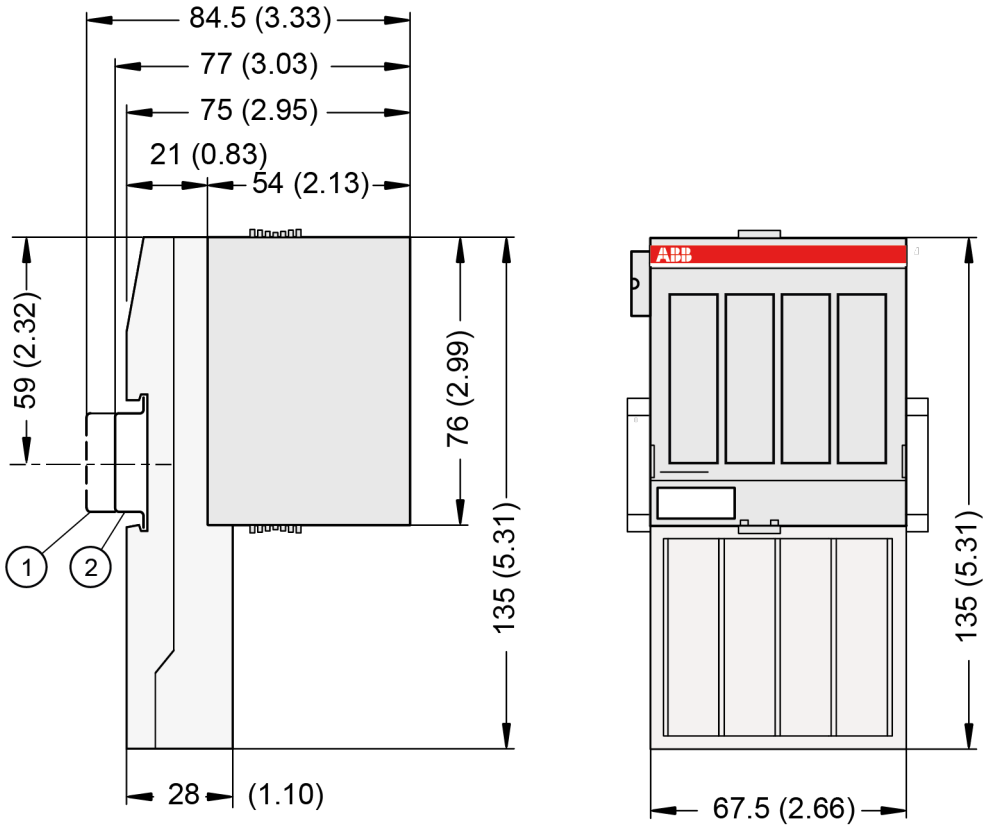
37.1 Assembly



37.2 Disassembly



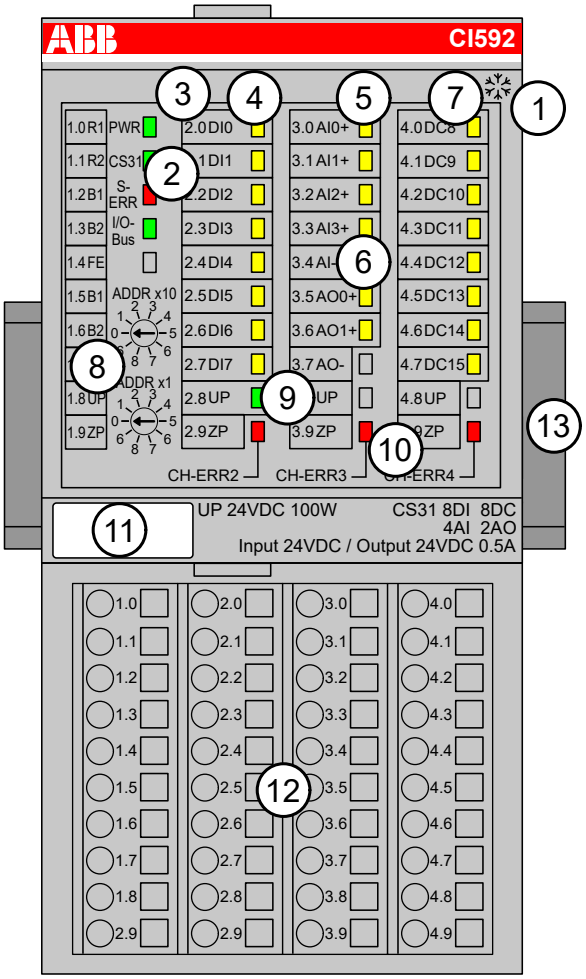
37.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

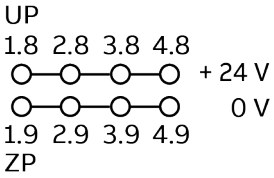
37.4 Connections



1 I/O bus
2 4 system LEDs
3 Allocation between terminal number and signal name
4 8 yellow LEDs to display the signal states of the digital inputs DI0 ... DI7
5 4 yellow LEDs to display the signal states of the analog inputs AI0 ... AI3
6 2 yellow LEDs to display the signal states of the analog outputs AO0 ... AO1
7 8 yellow LEDs to display the signal states of the configurable digital inputs/outputs DC8 ... DC15
8 2 rotary switches to set the module's address (00d ... 99d)
9 1 green LED to display the process voltage UP
10 3 red LEDs to display errors
11 Label
12 Terminal unit
13 DIN rail
❄ Sign for XC version

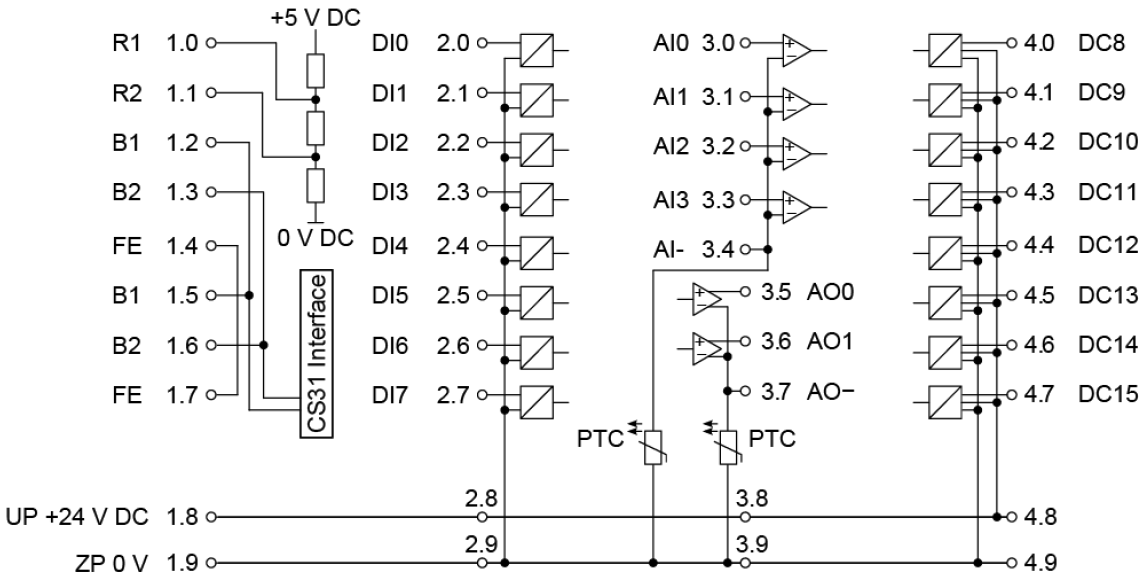
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

37.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

37.4.2 Inputs/Outputs



Example input or output

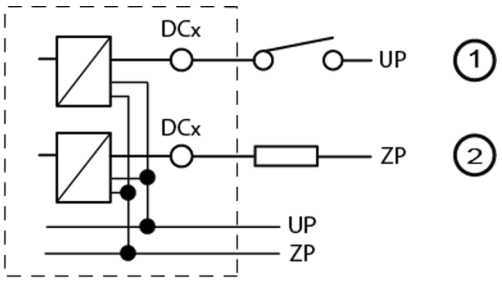
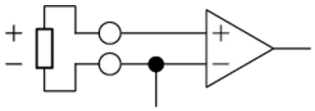


Fig. 65: Example as Input/Output

1 Example of connection as an input
2 Example of connection as an output

Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 66: Example as Input AIx

Example digital input

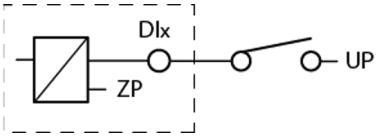
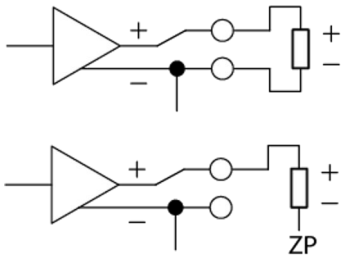


Fig. 67: Example as Input DIx

Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 68: Example as Output AOx

38 CM5610-2RS(-XC)

- CM5610-2RS
- CM5610-2RS-XC



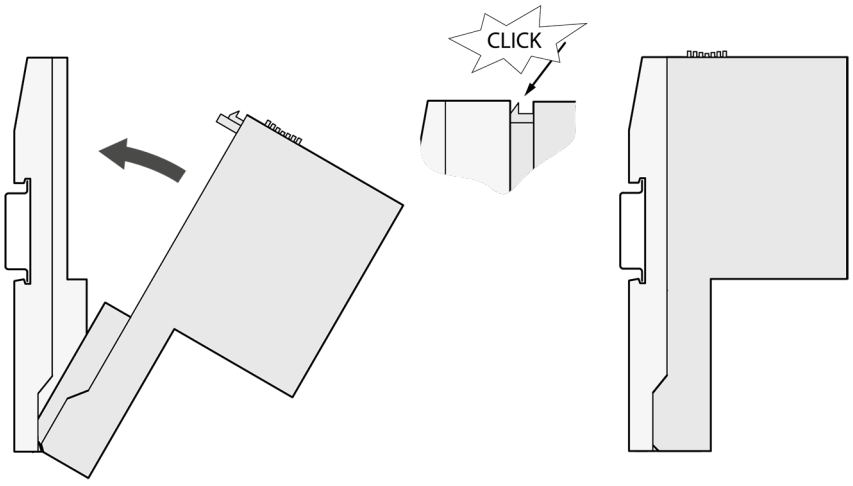
CAUTION!

Risk of injury and damaging the product!

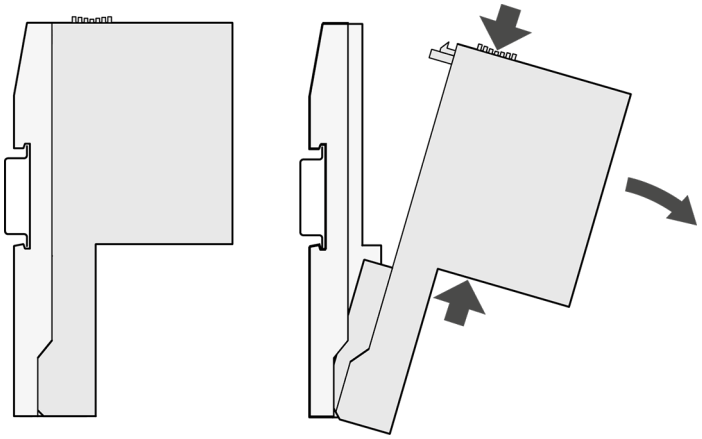
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

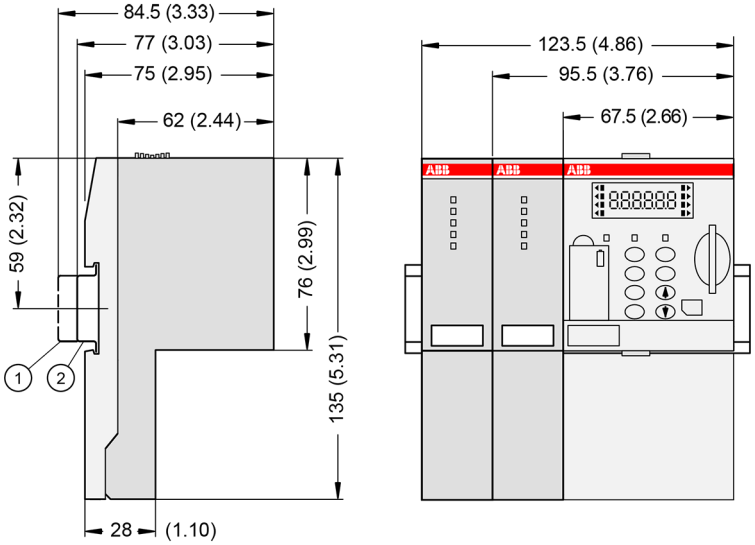
38.1 Assembly



38.2 Disassembly



38.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

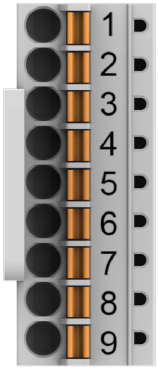
38.4 Connections



1 5 LEDs for state display
2 2 rotary switches for address setting
3 Label
4 2 serial interfaces: COM1 and COM2
❄ Sign for XC version

38.4.1 Serial interface

Pin assignment



Pin	Signal	Interface	Description
1	Term. P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Term. N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

38.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
CM5610	8 mm	X	-	0.5 x 3 mm	0.14 - 0.5 mm^2

39 CM5640-2ETH(-XC)

- CM5640-2ETH
- CM5640-2ETH-XC



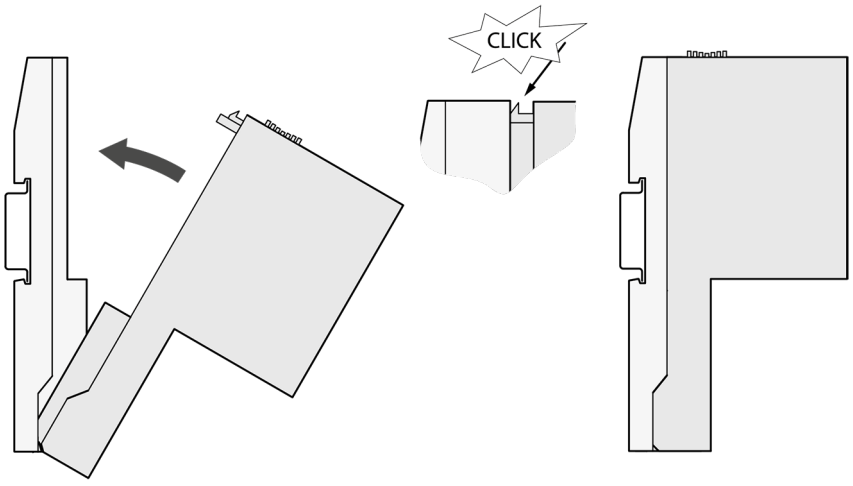
CAUTION!

Risk of injury and damaging the product!

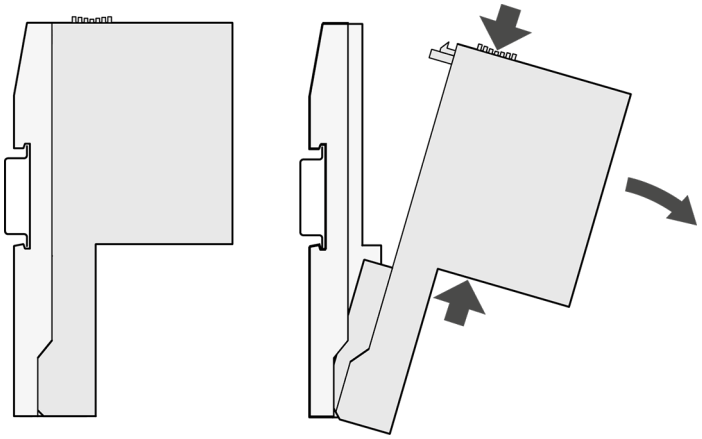
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

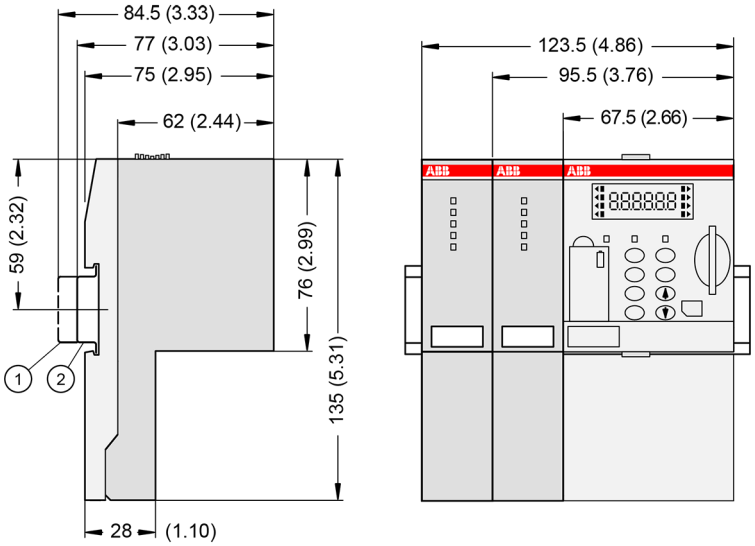
39.1 Assembly



39.2 Disassembly



39.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

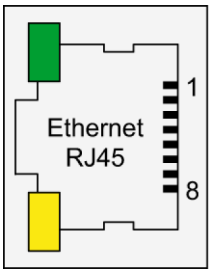
39.4 Connections



1 5 LEDs for state display
2 2 rotary switches for station identification
3 Label
4 2 communication interfaces Ethernet RJ45
❄ Sign for XC version

39.4.1 Ethernet network interface

Pin assignment

Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth



In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

40 CM574-x

- CM574-RS
- CM574-RCOM



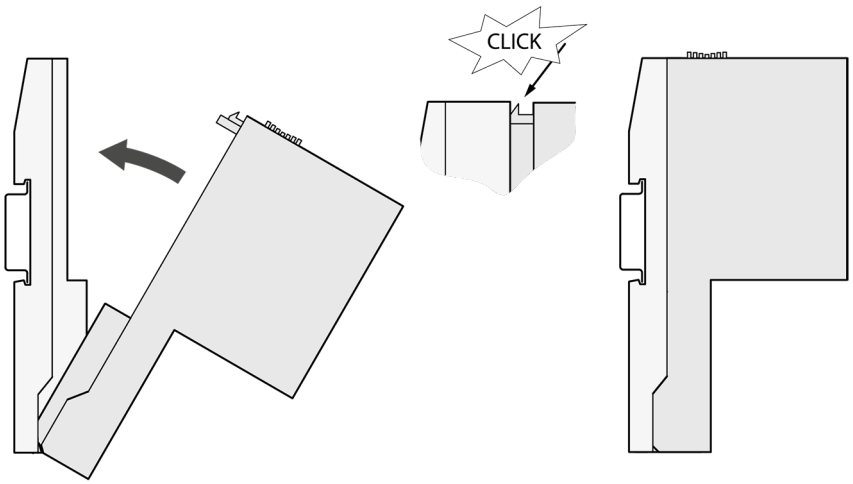
CAUTION!

Risk of injury and damaging the product!

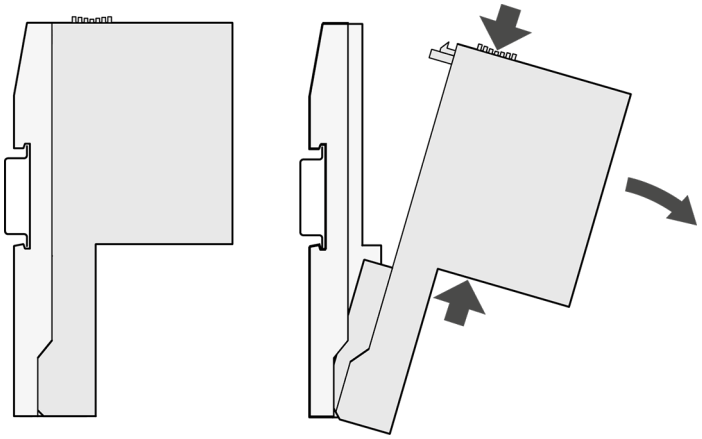
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

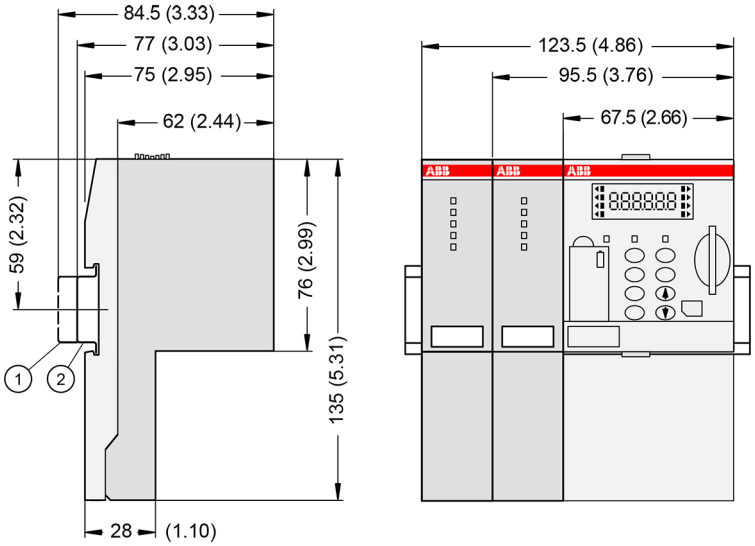
40.1 Assembly



40.2 Disassembly



40.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

40.4 Connections



Fig. 69: CM574-RS

1 5 LEDs for state display
2 2 rotary switches for address setting
3 Label
4 2 serial communication interfaces

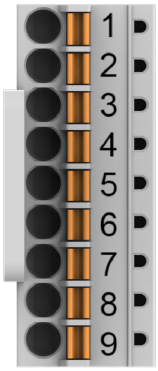


Fig. 70: CM574-RCOM

1 5 LEDs for state display
2 Label
3 2 interfaces: 1 RCOM protocol interface, 1 CONSOLE

40.4.1 Serial interface

Pin assignment



Pin	Signal	Interface	Description
1	Term. P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Term. N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

40.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
CM574	8 mm	X	-	0.5 x 3 mm	0.14 - 0.5 mm^2

41 CM579-x(-XC)

- CM579-PNIO
- CM579-PNIO-XC
- CM579-ETHCAT



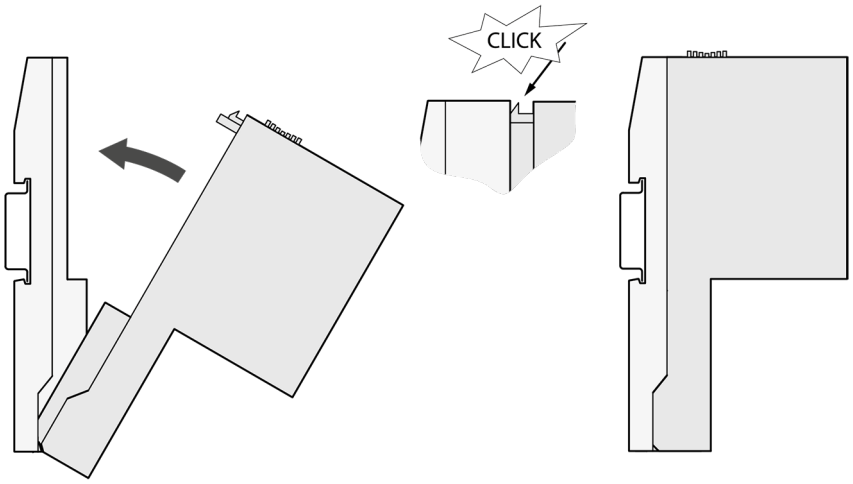
CAUTION!

Risk of injury and damaging the product!

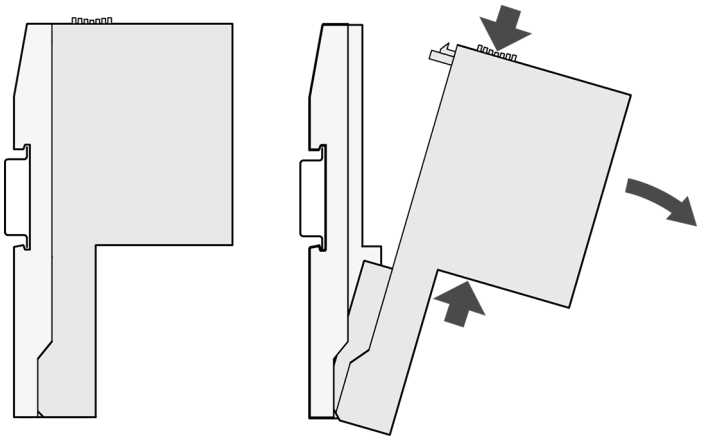
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

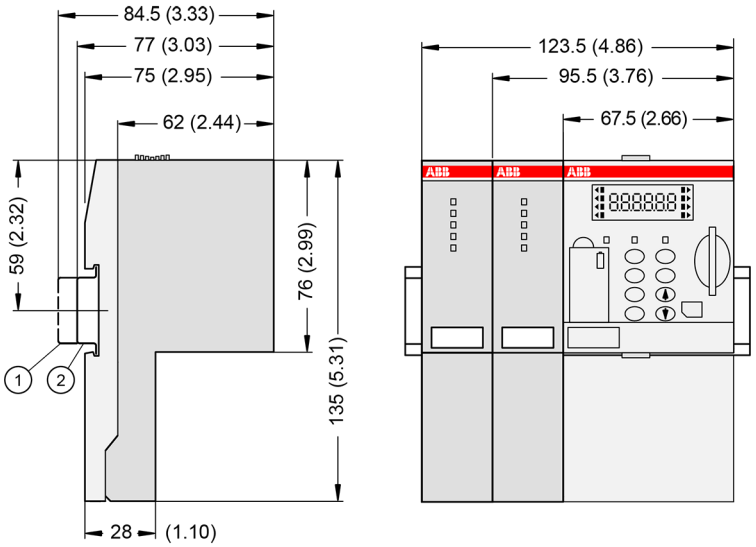
41.1 Assembly



41.2 Disassembly



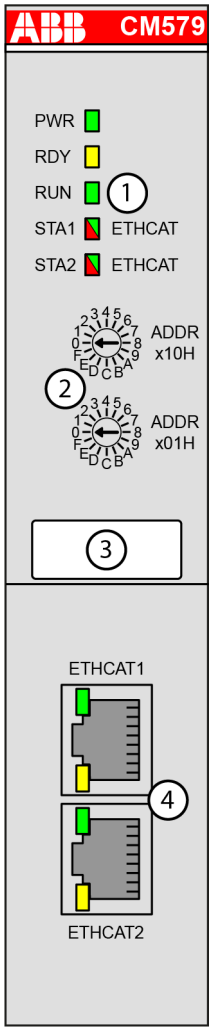
41.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

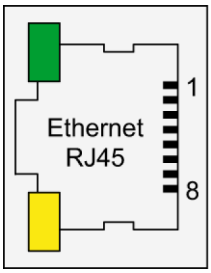
41.4 Connections



1 5 LEDs for state display
2 2 rotary switches for address setting (not used)
3 Label
4 2 communication interfaces RJ45 (ETHCAT1 and ETHCAT2)

41.4.1 Ethernet network interface

Pin assignment

Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

42 CM582-DP(-XC)

- CM582-DP
- CM582-DP-XC



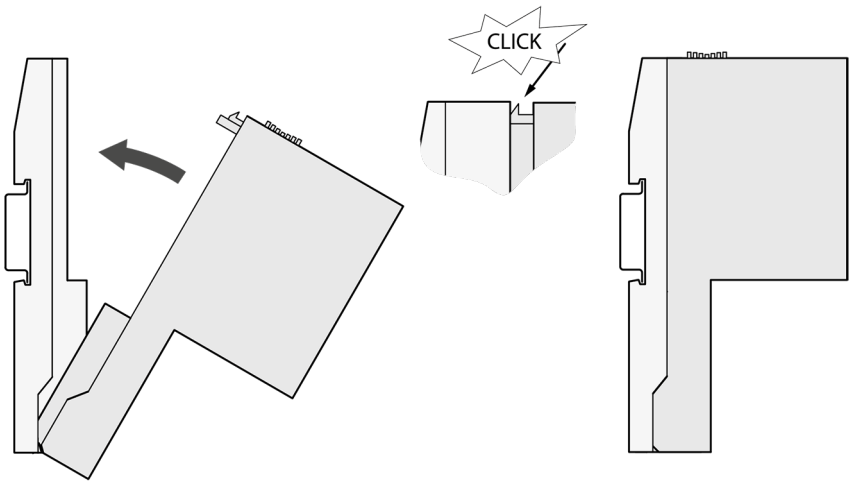
CAUTION!

Risk of injury and damaging the product!

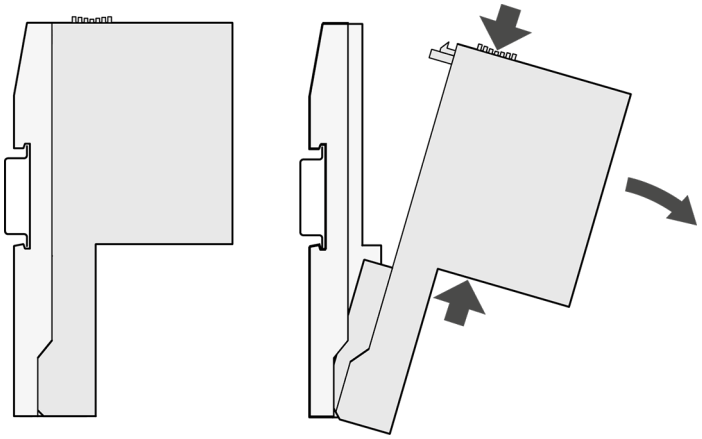
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

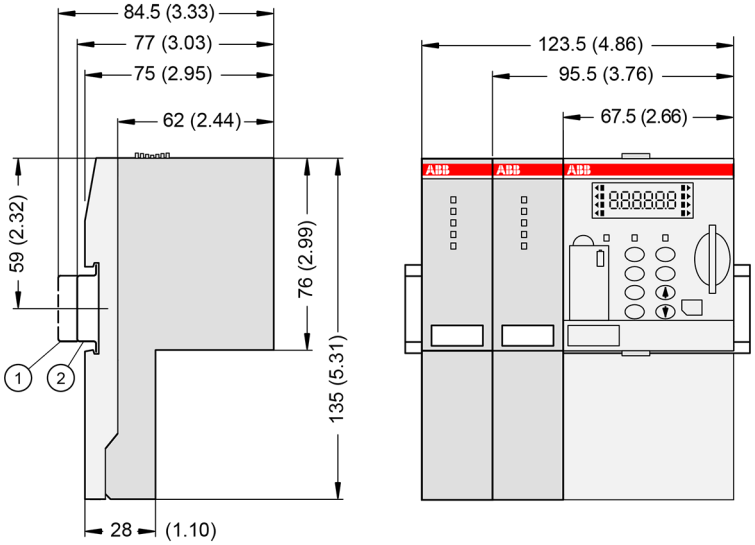
42.1 Assembly



42.2 Disassembly



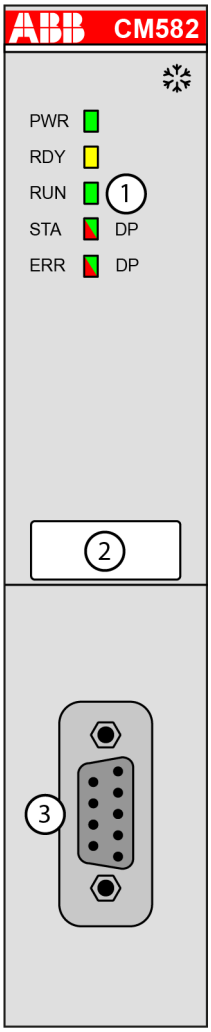
42.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

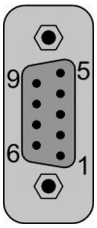
42.4 Connections



1 5 LEDs for state display
2 Label
3 Communication interface PROFIBUS DP D-sub, 9-pin, female
❄ Sign for XC version

42.4.1 PROFIBUS interface

Pin assignment



Pin	Signal	Description
1	NC	Not connected
2	NC	Not connected
3	RxD/TxD-P	Receive/Transmit positive
4	CNTR-P	Control signal for repeater, positive
5	DGND	Reference potential for data exchange and +5 VI
6	VP	+5 V (power supply for the bus terminating resistors)
7	NC	Not connected
8	RxD/TxD-N	Receive/Transmit negative
9	NC	Not connected



In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

43 CM588-CN(-XC)

- CM588-CN
- CM588-CN-XC



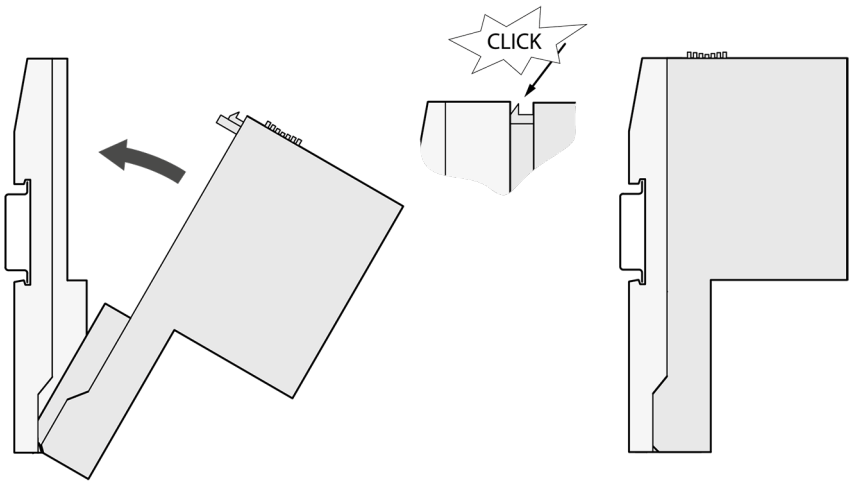
CAUTION!

Risk of injury and damaging the product!

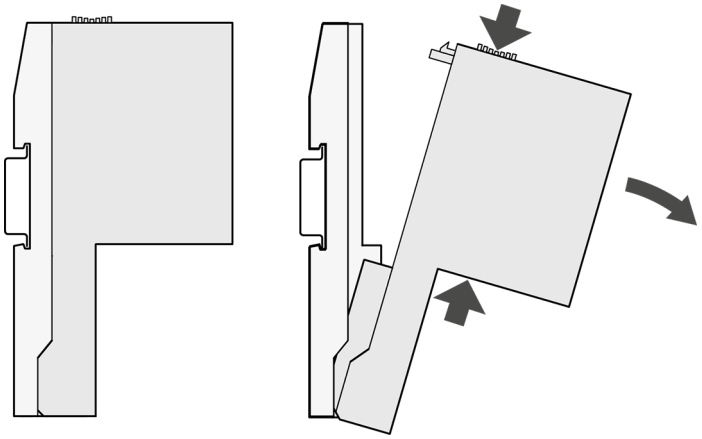
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

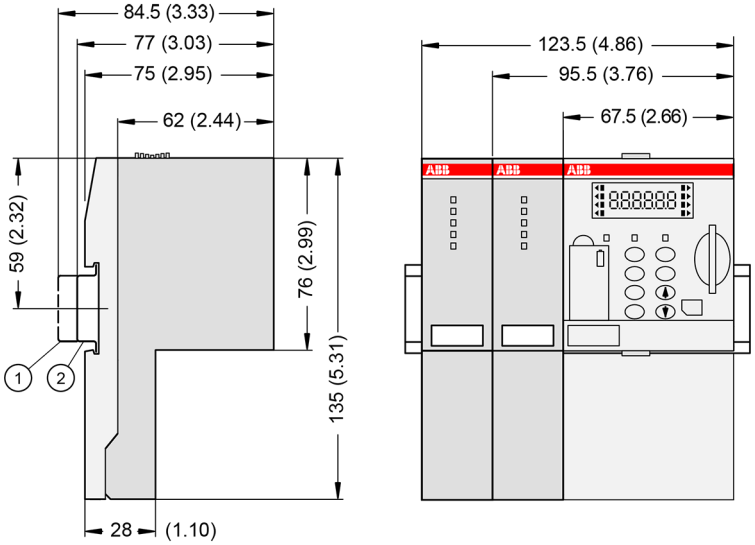
43.1 Assembly



43.2 Disassembly



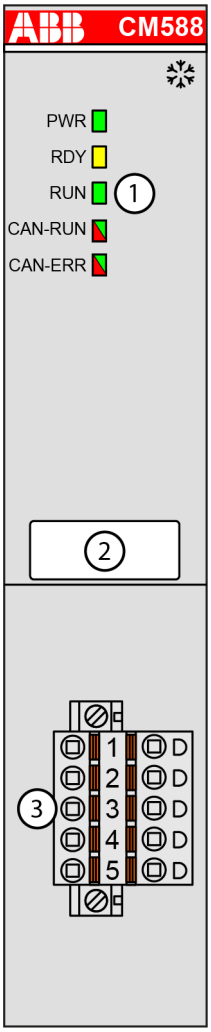
43.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

43.4 Connections

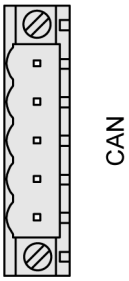
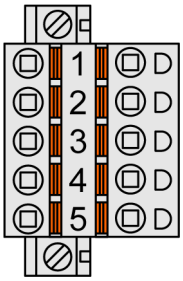


1 5 LEDs for state display
2 Label
3 Communication interface, 5-pin, Combicon, male, removable plug with spring terminals
❄ Sign for XC version

43.4.1 CAN interface

Pin assignment

Table 4: Pin assignment of the CANopen connector

Interface		PIN	Signal	Description
 Terminal block removed	 Terminal block inserted	1	CAN_GND	CAN reference potential
		2	CAN_L	Bus line, receive/transmit line, LOW
		3	CAN_SHLD	Shield of the bus line
		4	CAN_H	Bus line, receive/transmit line, HIGH
		5	NC	Not connected

NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

43.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
CM5x8 (CAN)	10 mm	X	-	0.5 x 3 mm	0.2 - 2.5 mm^2

44 CM589-PNIO(-4)(-XC)

- CM589-PNIO
- CM589-PNIO-XC
- CM589-PNIO-4
- CM589-PNIO-4-XC



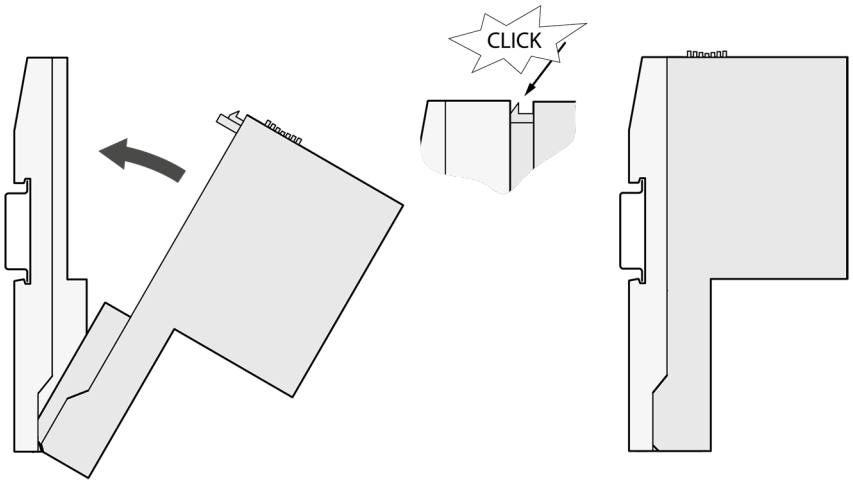
CAUTION!

Risk of injury and damaging the product!

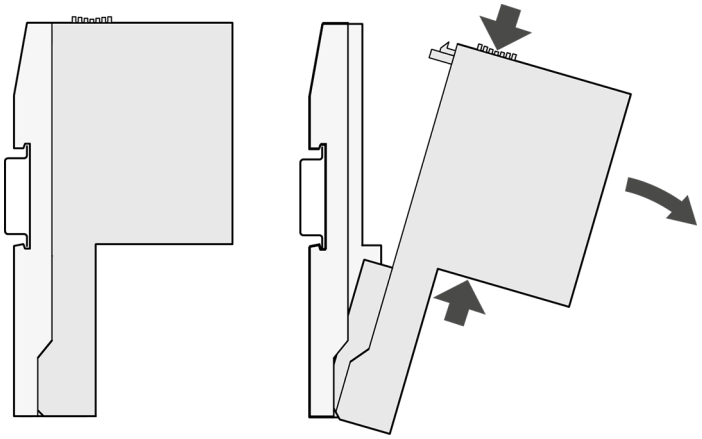
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

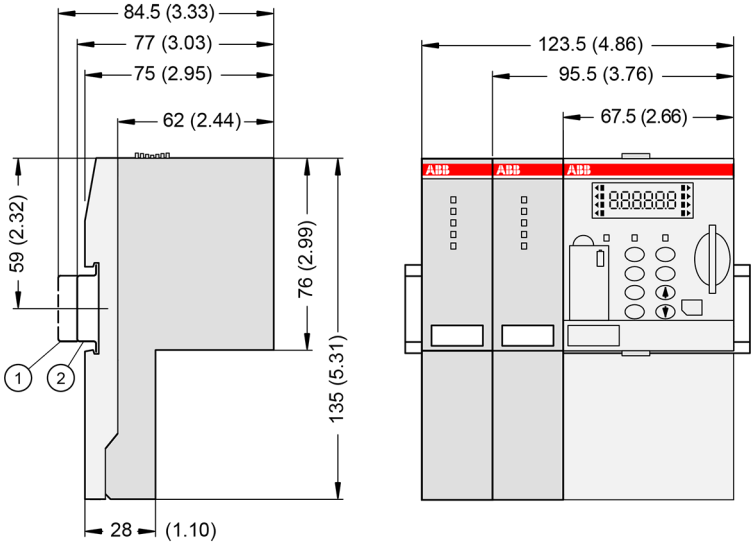
44.1 Assembly



44.2 Disassembly



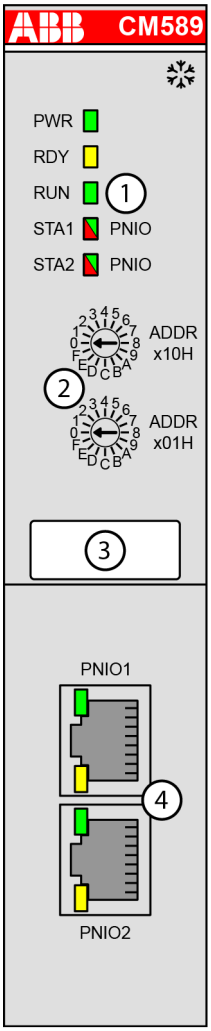
44.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

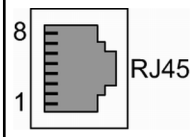
44.4 Connections



1 5 LEDs for state display
2 2 rotary switches for setting the I/O device identifier
3 Label
4 2 communication interfaces RJ45 (PNIO1 and PNIO2)
❄ Sign for XC version

44.4.1 Ethernet network interface

Pin assignment



Pin	Signal	Description
1	TxD+	Transmit data +
2	TxD-	Transmit data -
3	RxD+	Receive data +
4	NU	Not used
5	NU	Not used
6	RxD-	Receive data -
7	NU	Not used
8	NU	Not used
Shield	Cable shield	Functional earth



In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

45 CM592-DP(-XC)

- CM592-DP
- CM592-DP-XC



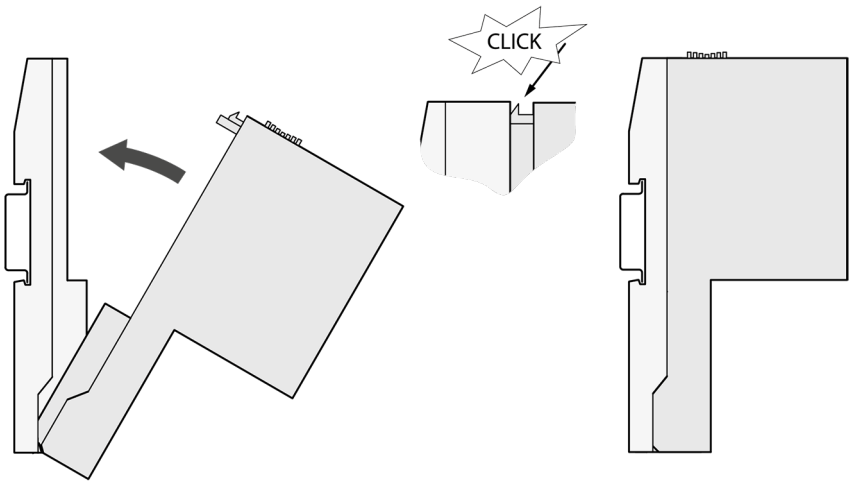
CAUTION!

Risk of injury and damaging the product!

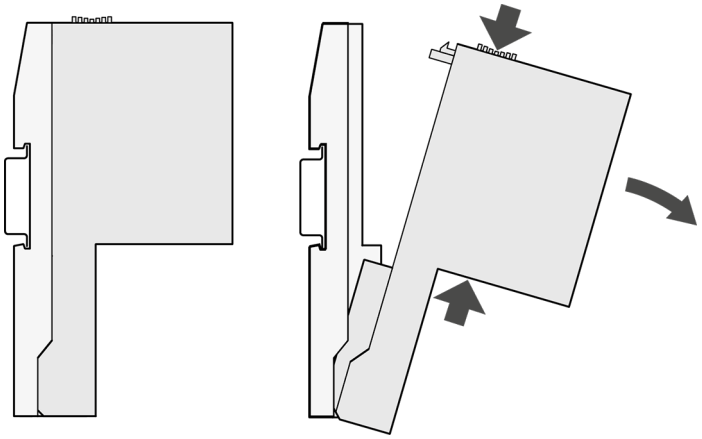
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

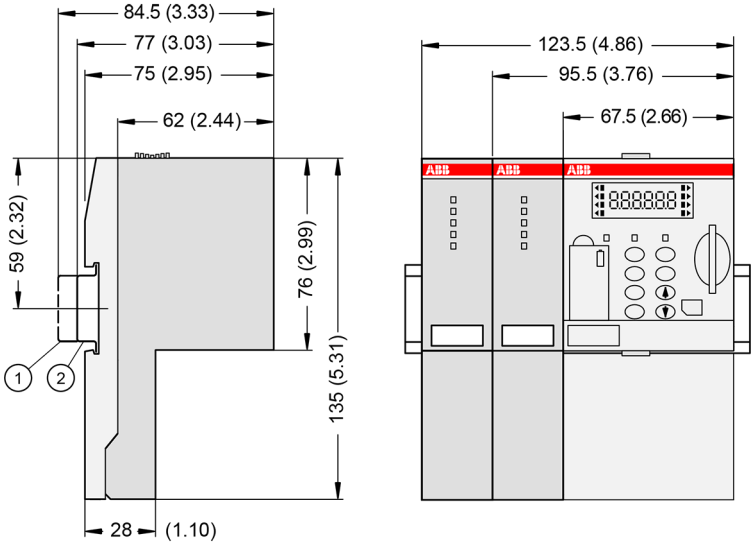
45.1 Assembly



45.2 Disassembly



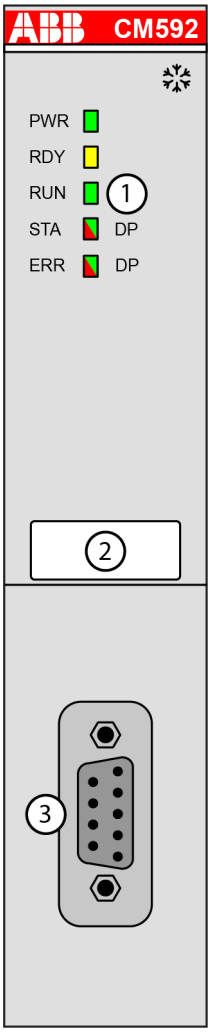
45.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

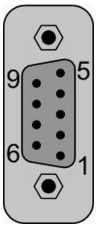
45.4 Connections



1 5 LEDs for state display
2 Label
3 Communication interface PROFIBUS DP D-sub, 9-pin, female
❄ Sign for XC version

45.4.1 PROFIBUS interface

Pin assignment



Pin	Signal	Description
1	NC	Not connected
2	NC	Not connected
3	RxD/TxD-P	Receive/Transmit positive
4	CNTR-P	Control signal for repeater, positive
5	DGND	Reference potential for data exchange and +5 VI
6	VP	+5 V (power supply for the bus terminating resistors)
7	NC	Not connected
8	RxD/TxD-N	Receive/Transmit negative
9	NC	Not connected

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

46 CM597-ETH(-XC)

- CM597-ETH
- CM597-ETH-XC



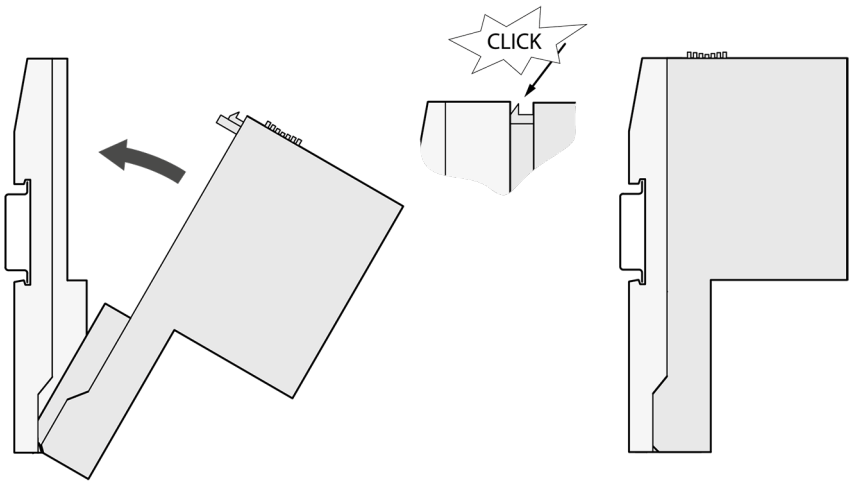
CAUTION!

Risk of injury and damaging the product!

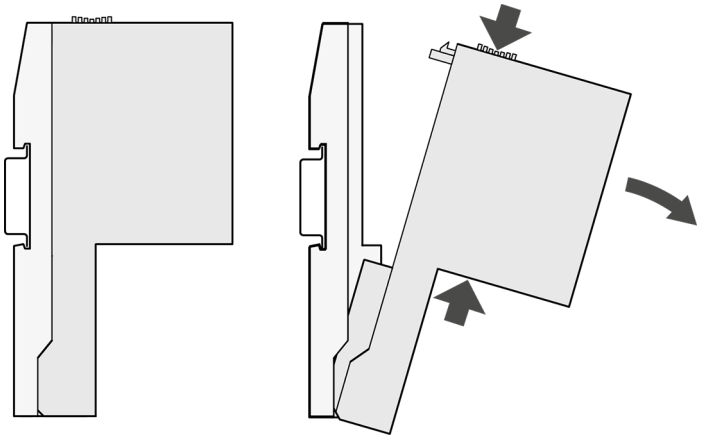
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

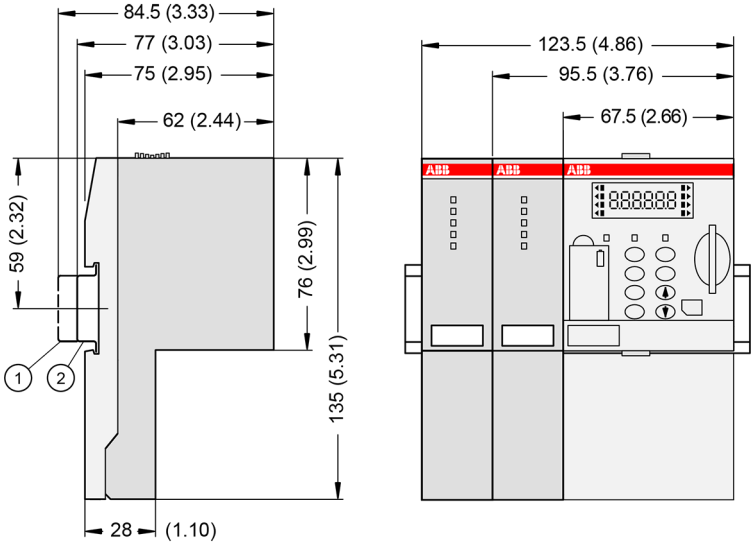
46.1 Assembly



46.2 Disassembly



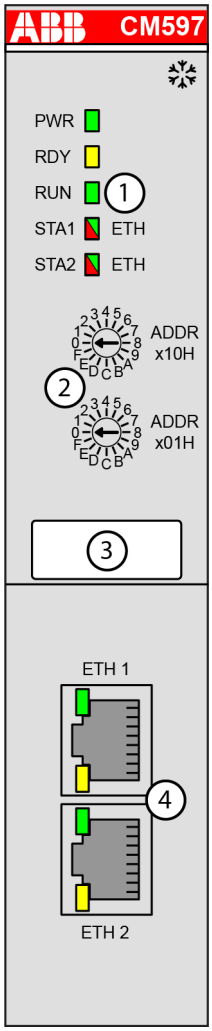
46.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

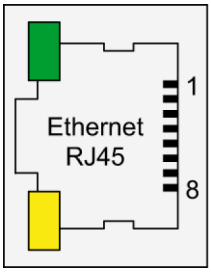
46.4 Connections



1 5 LEDs for state display
2 2 rotary switches for address setting
3 Label
4 2 communication interfaces Ethernet RJ45
❄ Sign for XC version

46.4.1 Ethernet network interface

Pin assignment



Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth



In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

47 CM598-CN(-XC)

- CM598-CN
- CM598-CN-XC



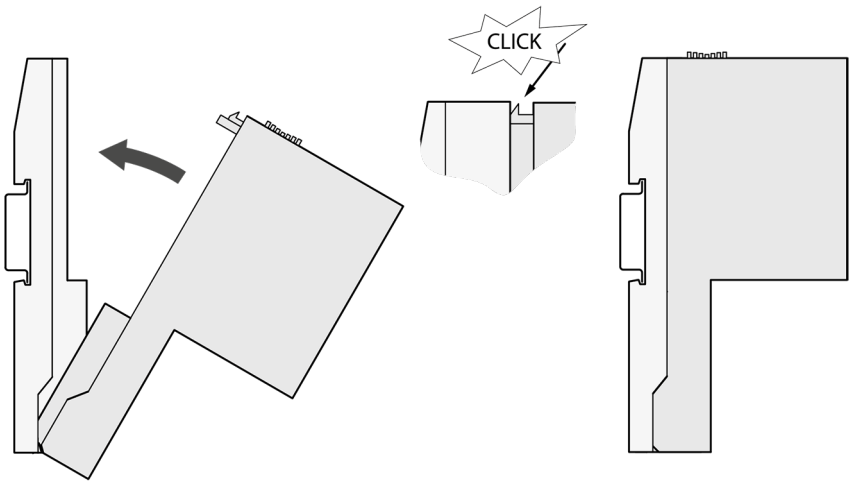
CAUTION!

Risk of injury and damaging the product!

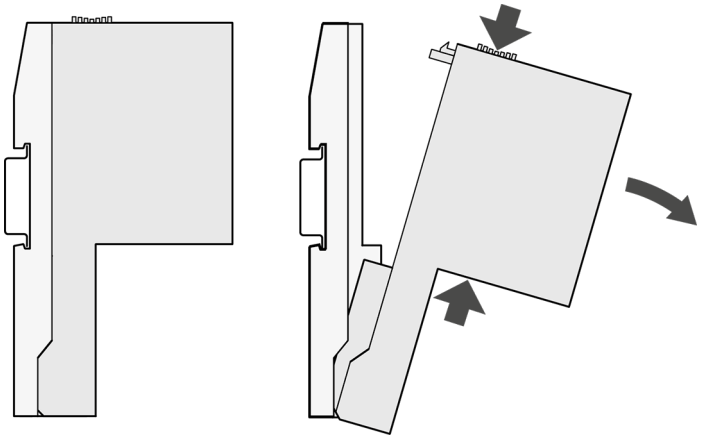
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

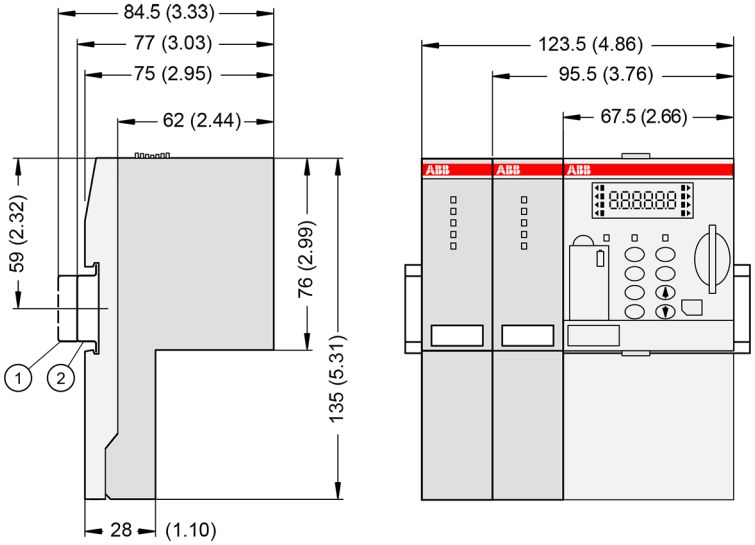
47.1 Assembly



47.2 Disassembly



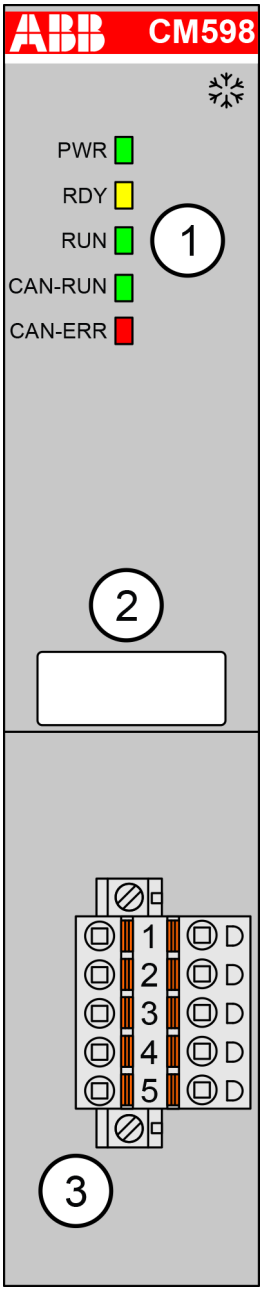
47.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

47.4 Connections

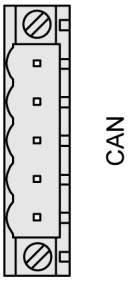
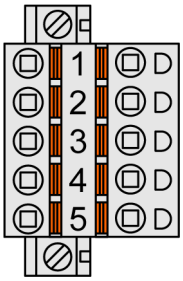


1 5 LEDs for state display
2 Label
3 Communication interface, 5-pin, Combicon, male, removable plug with spring terminals
Sign for XC version

47.4.1 CAN interface

Pin assignment

Table 5: Pin assignment of the CANopen connector

Interface		PIN	Signal	Description
 Terminal block removed	 Terminal block inserted	1	CAN_GND	CAN reference potential
		2	CAN_L	Bus line, receive/transmit line, LOW
		3	CAN_SHLD	Shield of the bus line
		4	CAN_H	Bus line, receive/transmit line, HIGH
		5	NC	Not connected

NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

47.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
CM5x8 (CAN)	10 mm	X	-	0.5 x 3 mm	0.2 - 2.5 mm^2

48 DA501(-XC)

- DA501
- DA501-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

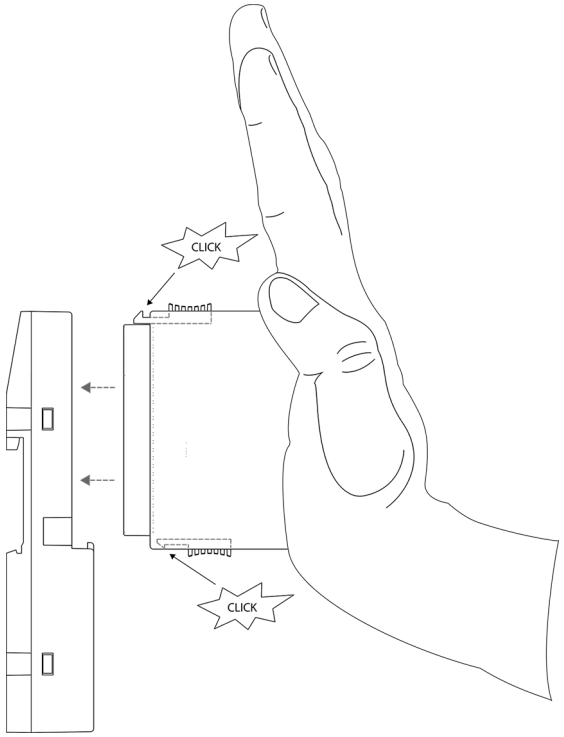
NOTICE!

Hot swap

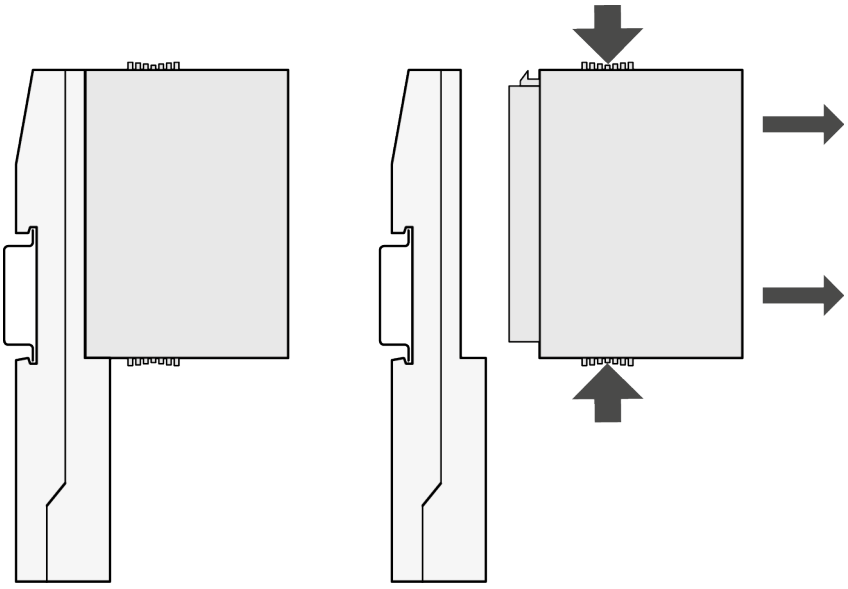
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

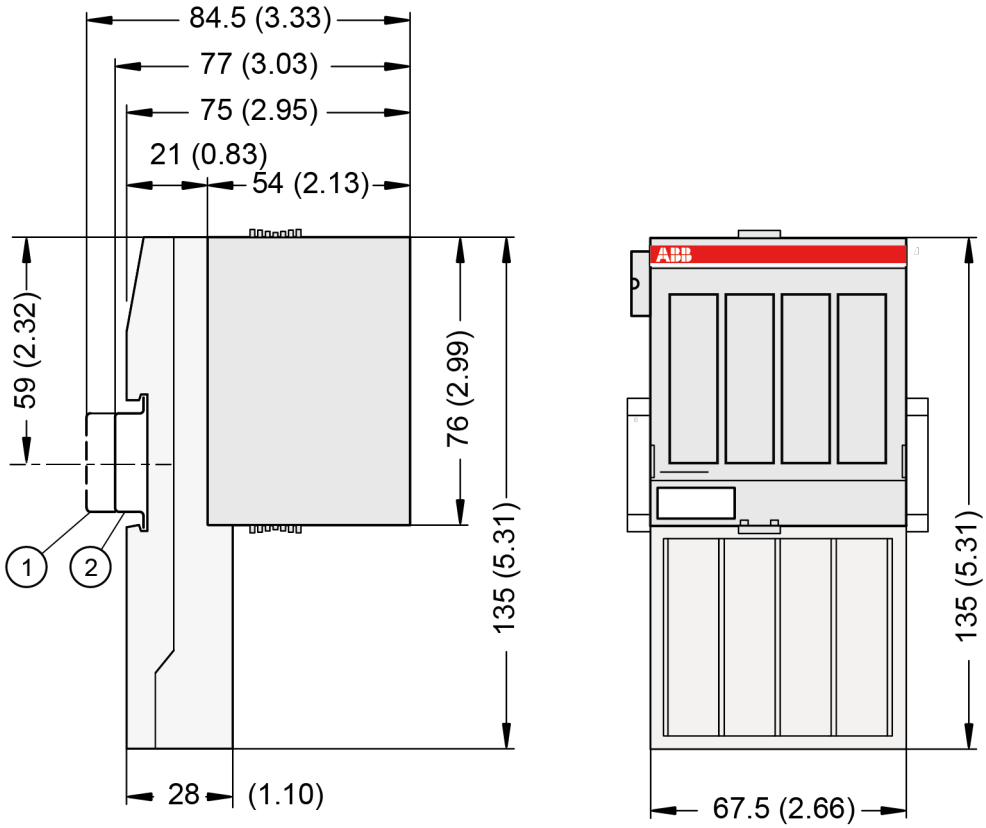
48.1 Assembly



48.2 Disassembly



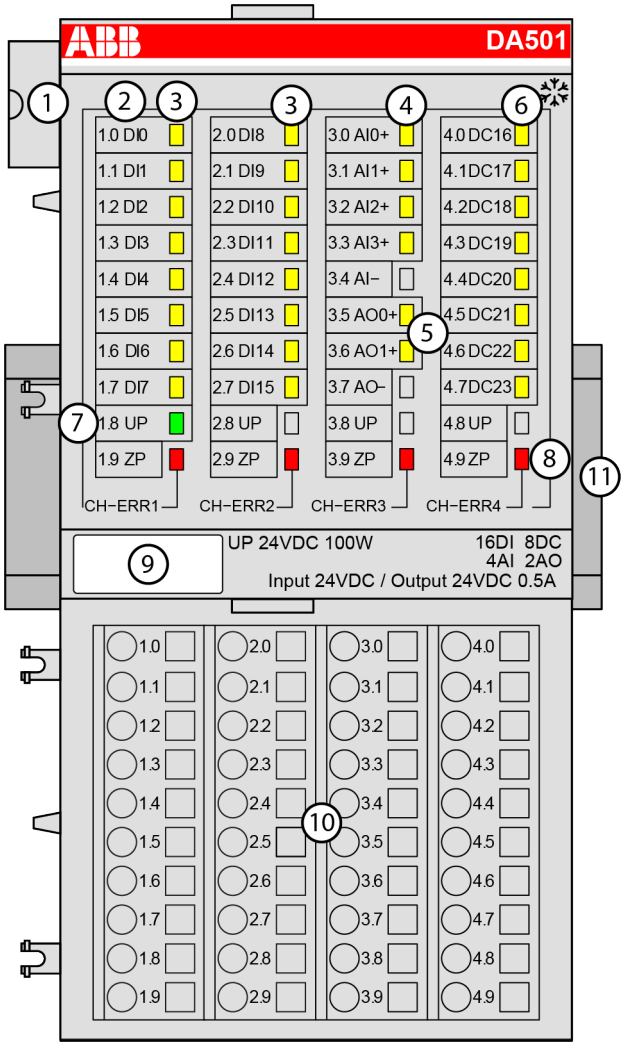
48.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

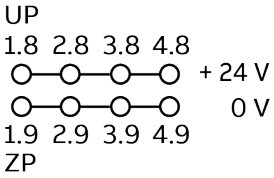
48.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 16 yellow LEDs to display the signal states of the digital inputs DI0 ... DI15
4 4 yellow LEDs to display the signal states of the analog inputs AI0 ... AI3
5 2 yellow LEDs to display the signal states of the analog outputs AO0 ... AO1
6 8 yellow LEDs to display the signal state of the configurable digital inputs/outputs DC16 ... DC23
7 1 green LED to display the state of the process supply voltage UP
8 4 red LEDs to display errors
9 Label
10 Terminal unit
11 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

48.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

48.4.2 Inputs/Outputs

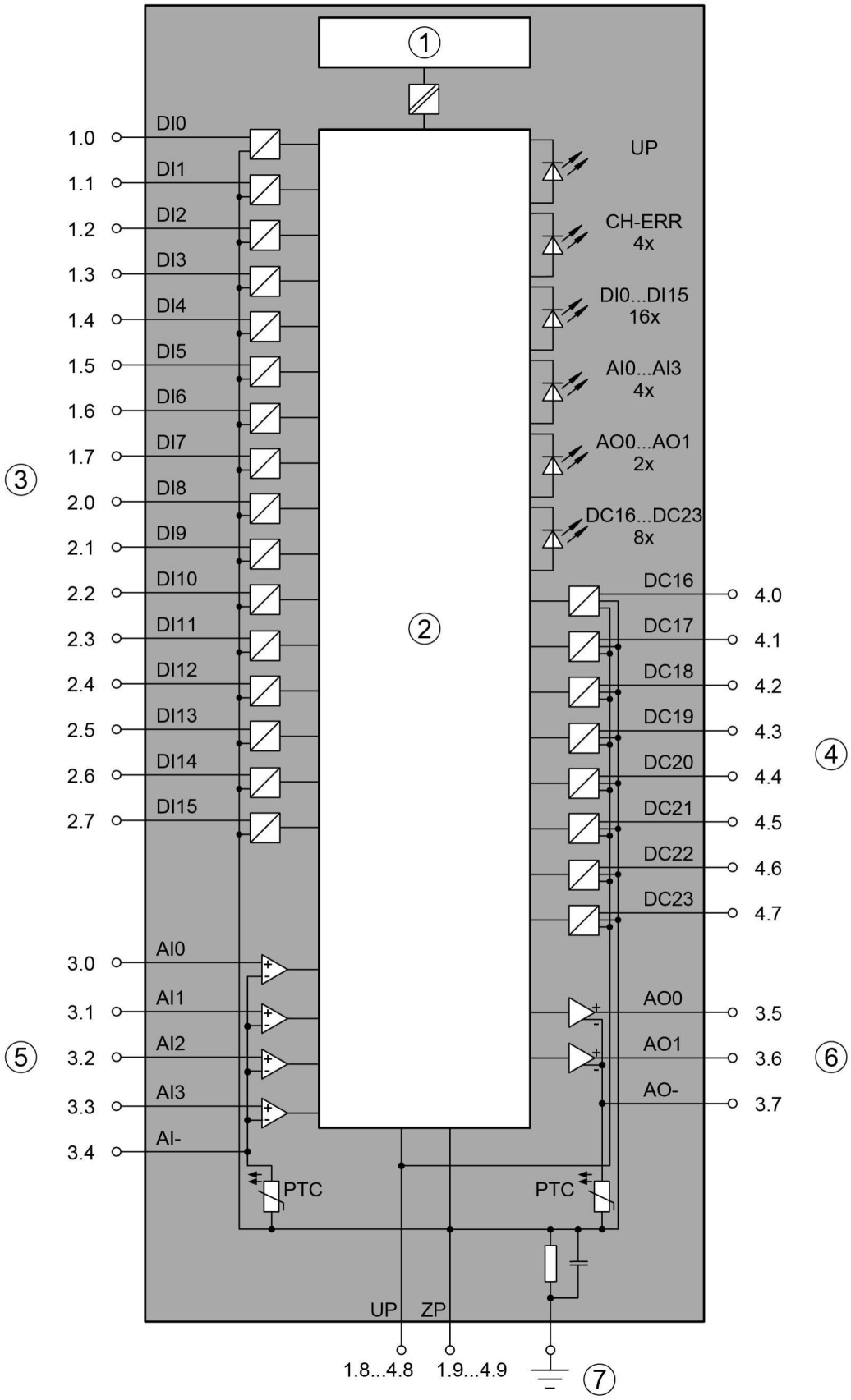


Fig. 71: Terminal assignment of the module

1 I/O bus interface
2 Logic

3 Digital input
4 Digital input/output
5 Pole of analog input signal
6 Pole of analog output signal
7 Functional earth connection

Example digital input

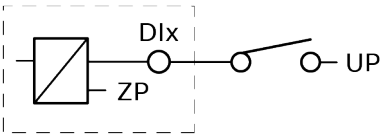
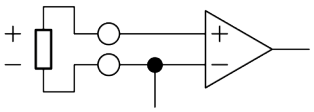


Fig. 72: Example of connection input DIx

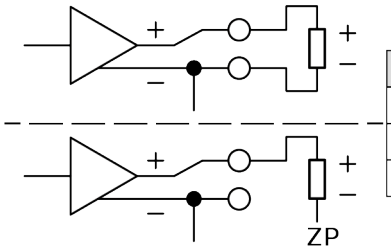
Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 73: Example of connection input AIx

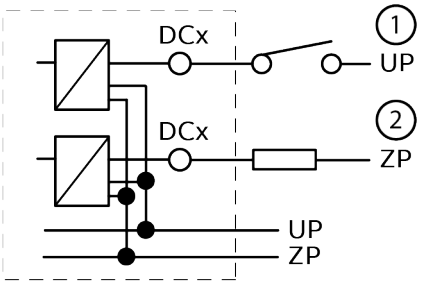
Example analog output



AO0 ... AO1
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA

Fig. 74: Example of connection output AOx

Example input or output



1 Example of connection as an input
2 Example of connection as an output

49 DA502(-XC)

- DA502
- DA502-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

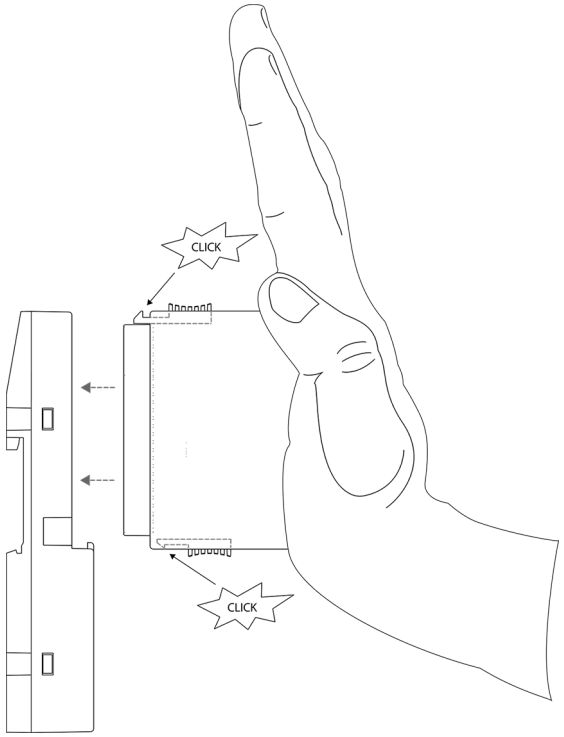
NOTICE!

Hot swap

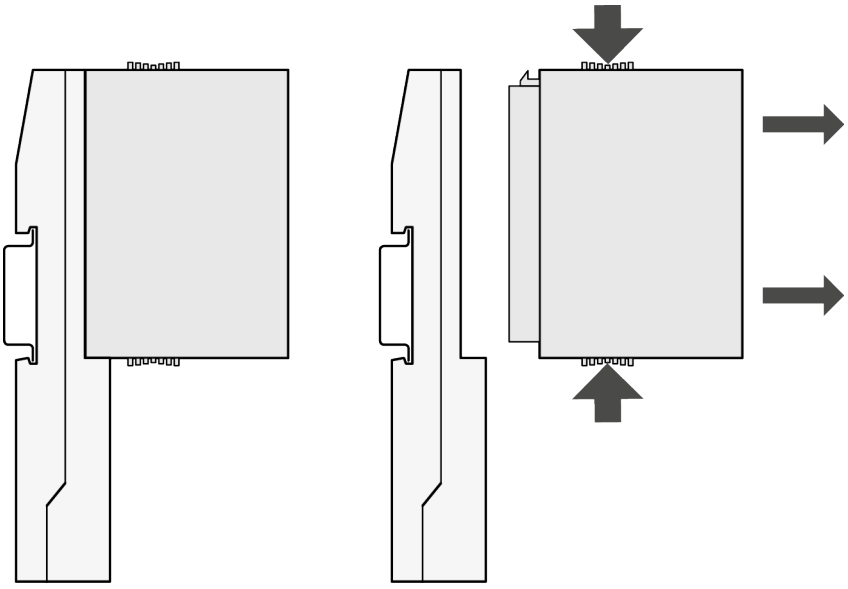
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

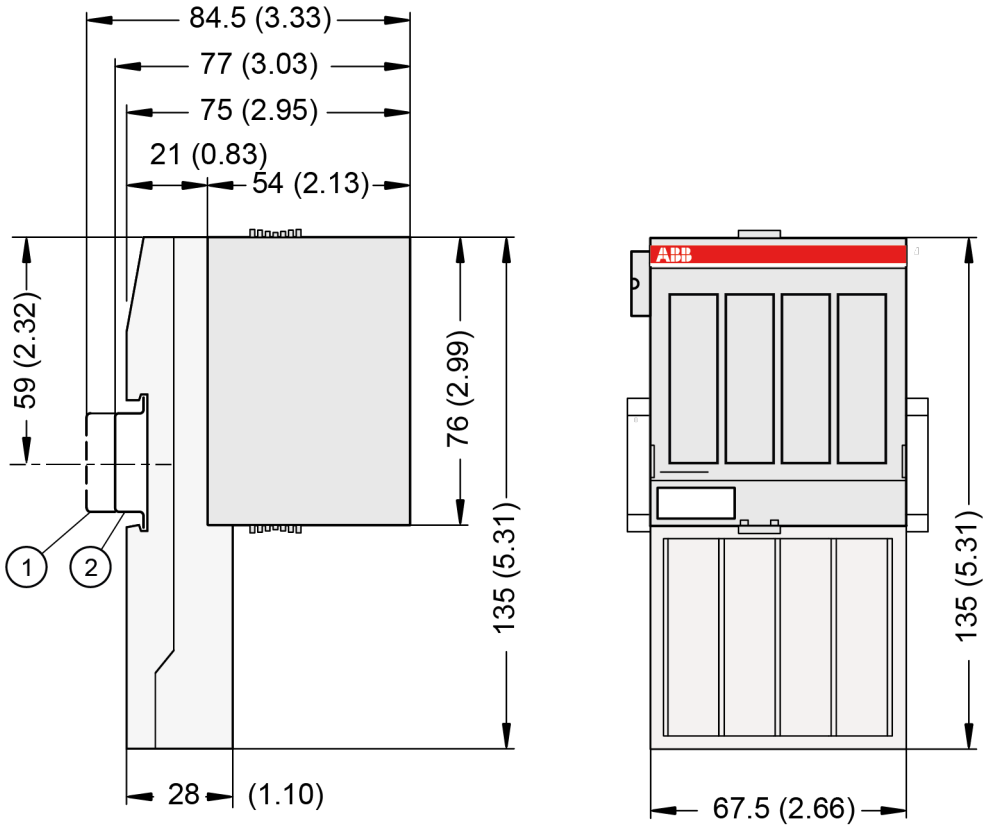
49.1 Assembly



49.2 Disassembly



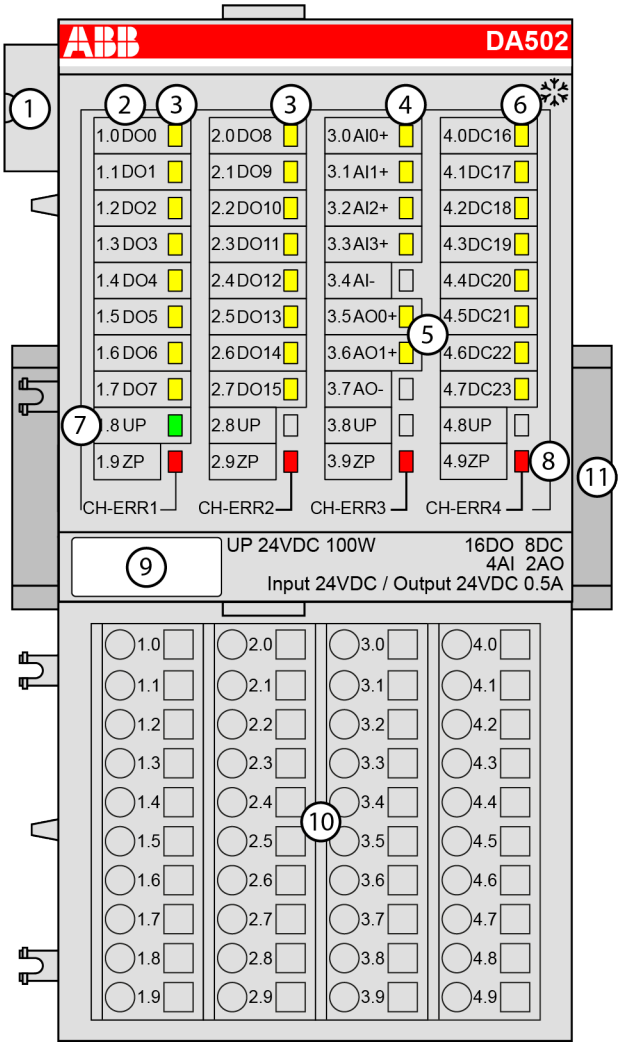
49.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

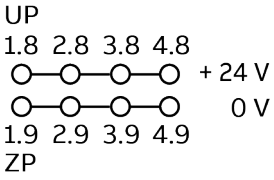
49.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 16 yellow LEDs to display the signal states of the digital outputs DO0 ... DO15
4 4 yellow LEDs to display the signal states of the analog inputs AI0 ... AI3
5 2 yellow LEDs to display the signal states of the analog outputs AO0 ... AO1
6 8 yellow LEDs to display the signal states of the configurable digital inputs/outputs DC16 ... DC23
7 1 green LED to display the state of the process supply voltage UP
8 4 red LEDs to display errors
9 Label
10 Terminal unit
11 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

49.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

49.4.2 Inputs/Outputs

Example digital output

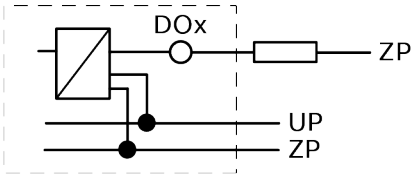
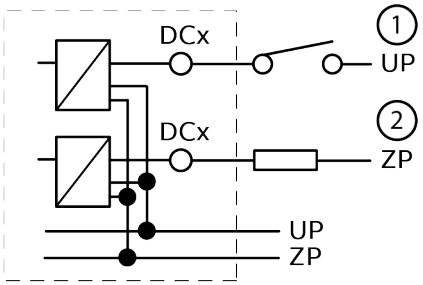


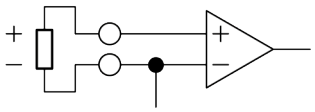
Fig. 75: Example of connection output DOx

Example input or output



1 Example of connection as an input
2 Example of connection as an output

Example analog input



AI0 ... AI3
0 V ... +10 V
± 10 V
0 mA ... +20 mA
+4 mA ... +20 mA
Pt100 / Pt1000
Ni1000

Fig. 76: Example of connection input AIx

Example analog output

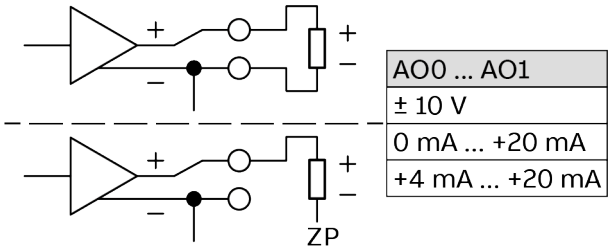
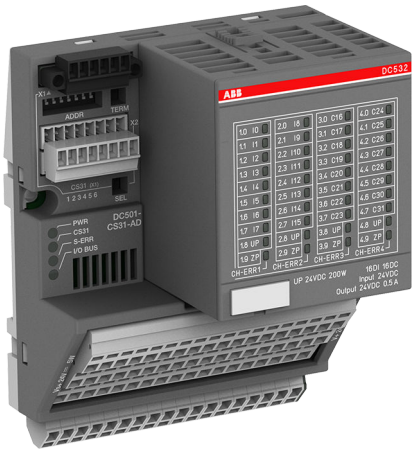


Fig. 77: Example of connection output AOx

50 DC501-CS31-AD

- DC501-CS31-AD



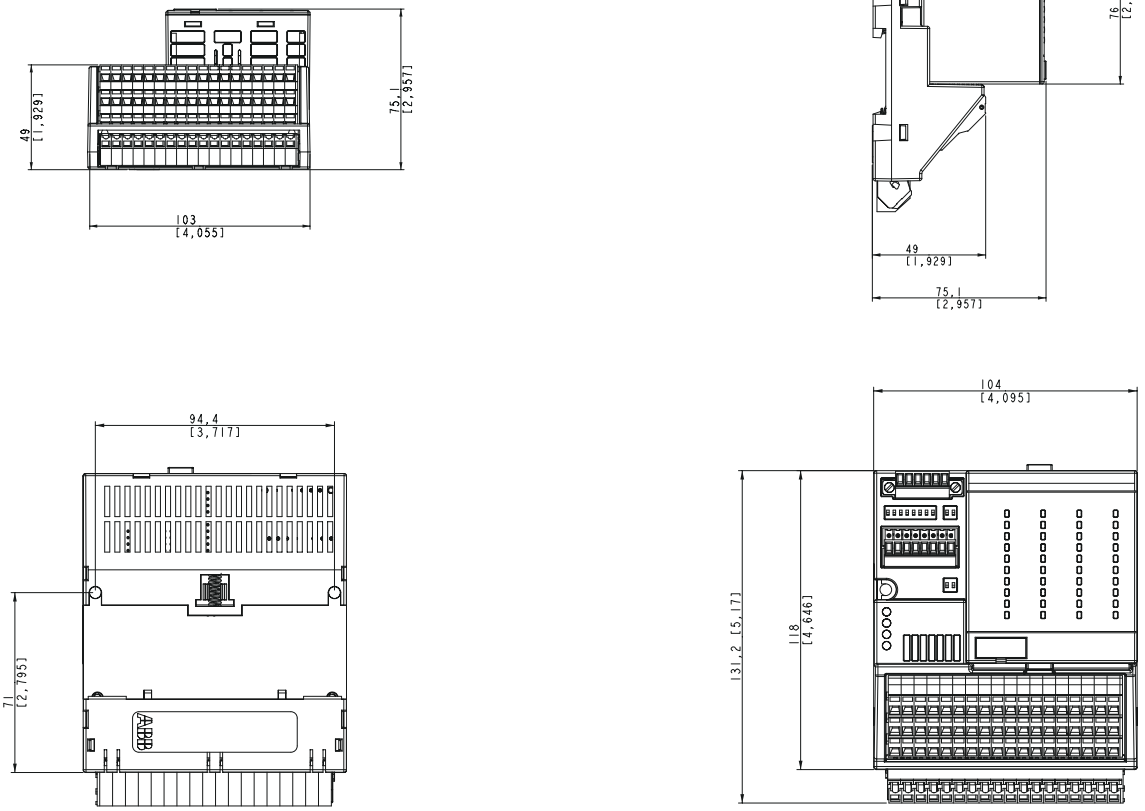
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

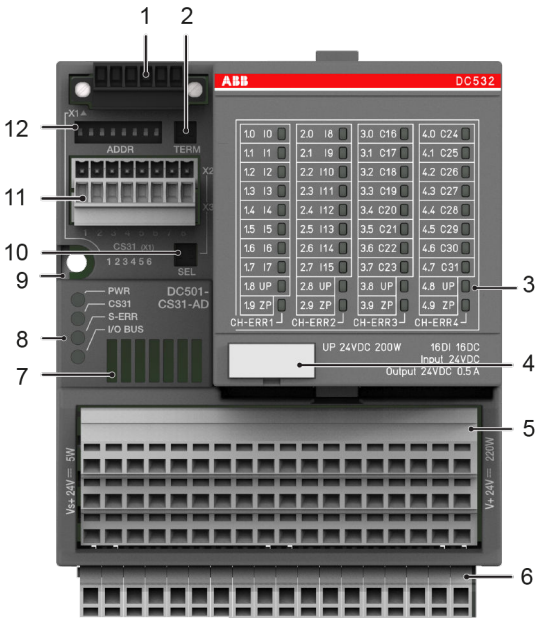
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

50.1 Dimensions



The dimensions are in mm and in brackets in inch.

50.2 Connections



1 Connection for CS31 bus (X1)
2 Bus termination (CS31 bus)
3 Status LEDs for DC532
4 TA525: Label
5 Terminals signal level (X4). 16 digital inputs, 8 digital outputs, 8 DC voltage supply (incl. DC532)
6 Terminals signal level (plug-in power bus)
7 Ventilation
8 4 Status LEDs
9 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
10 Function selector switch for I/O extension
11 4 digital inputs (X2): 24 V DC. 3 analog inputs, 1 analog output (X3): 0 V … +10 V.
12 DIP switch for ADDR (X1)

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

50.2.1 Bus termination

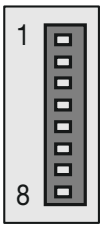


	ON	OFF
S1 + S2:	Term.	No term.

Switch 1 and 2 are set to ON: termination of CS31 bus.

Switch 1 and 2 are set to OFF: CS31 bus is not terminated.

50.2.2 ADDR

		ON	OFF
	S1: C	16 I/ 16 O	24 I/ 16 O
	S2: 64	ADDR: 32	0
	S3: 32	ADDR: 16	0
	S4: 16	ADDR: 8	0
	S5: 8	ADDR: 4	0
	S6: 4	ADDR: 2	0
	S7: 2	ADDR: 1	0
	S8: 1	NC	NC

50.2.3 SEL



	ON	OFF
S1:	DI501	0
S2:	AX501	0

Switch 1 and 2 are set to ON: No extensions are allowed, module DC501R0100 is used.

50.2.4 Plug connection

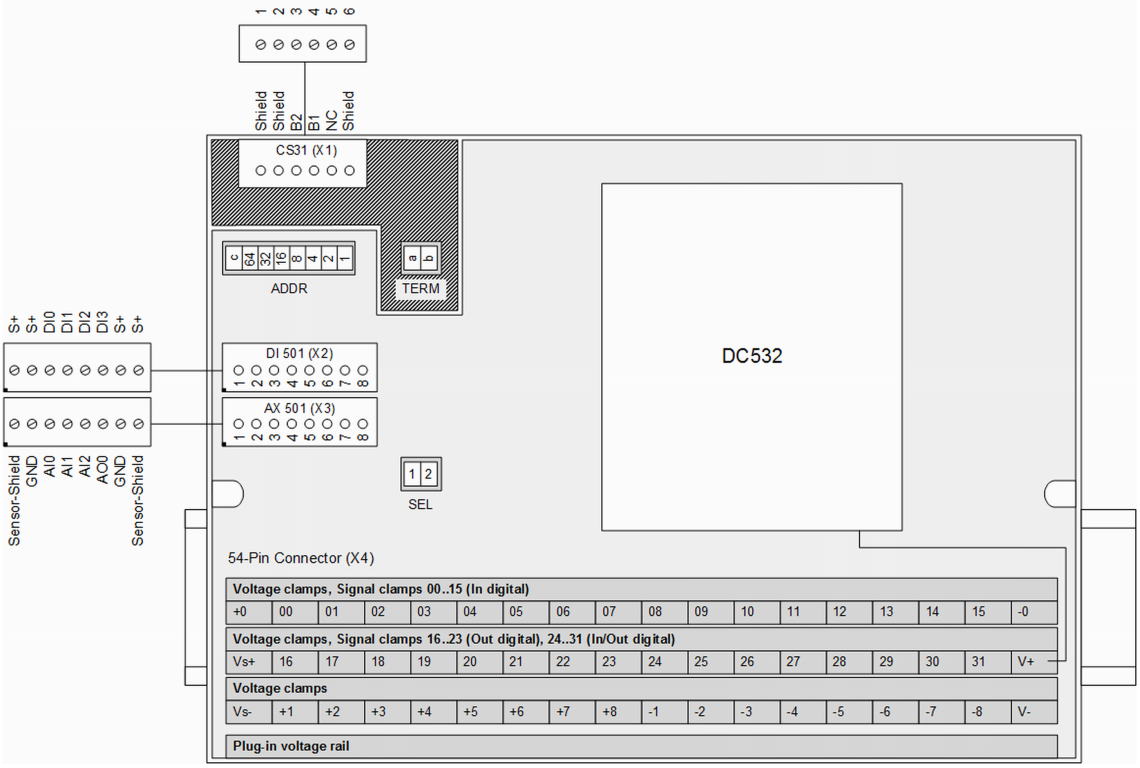


Table 6: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	Shield (internally connected to pins 2 and 6. No internal connection to functional earth)
X1 / Shield	2	Shield (internally connected to pins 1 and 6. No internal connection to functional earth)
X1 / B2	3	BUS 2
X1 / B1	4	BUS 1
X1 / NC	5	Not connected
X1 / Shield	6	Shield (internally connected to pins 1 and 2. No internal connection to functional earth)

Table 7: Pin assignment DI501 (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / S+	1	Auxiliary voltage (max. 32 mA total load of S+ permitted) for DI0 - DI3. Voltage derived from input voltage Vs+ (X4)
X2 / S+	2	Auxiliary voltage (max. 32 mA total load of S+ permitted) for DI0 - DI3. Voltage derived from input voltage Vs+ (X4)
X2 / DI0	3	Digital extension input 0
X2 / DI1	4	Digital extension input 1
X2 / DI2	5	Digital extension input 2
X2 / DI3	6	Digital extension input 3
X2 / S+	7	Auxiliary voltage (max. 32 mA total load of S+ permitted) for DI0 - DI3. Voltage derived from input voltage Vs+ (X4)
X2 / S+	8	Auxiliary voltage (max. 32 mA total load of S+ permitted) for DI0 - DI3. Voltage derived from input voltage Vs+ (X4)

Table 8: Pin assignment AX501 (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / Sensor shield	1	Sensor shield
X3 / GND	2	GND
X3 / AI0	3	Analog extension input 0
X3 / AI1	4	Analog extension input 1
X3 / AI2	5	Analog extension input 2
X3 / AO0	6	Analog extension output 0
X3 / GND	7	GND
X3 / Sensor shield	8	Sensor shield

The connections X3 / 2 and X3 / 7 (GND) are directly connected to X4 / Vs-, X4 / V-. There is no AGND potential in accordance with module AX501. In module AX501, AGND is connected to GND via a resistor.

Both sensor shield connections of X3 are interconnected and jointly connected to FE via 10 MΩ || 4 nF.

Table 9: Pin assignment 54 pin connector (X4)

Connector / Block	Pin	Assignment / Signal
X4 / 1	+0	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 1	00	DC532 / I0
X4 / 1	01	DC532 / I1
X4 / 1	02	DC532 / I2
X4 / 1	03	DC532 / I3
X4 / 1	04	DC532 / I4
X4 / 1	05	DC532 / I5
X4 / 1	06	DC532 / I6
X4 / 1	07	DC532 / I7
X4 / 1	08	DC532 / I8
X4 / 1	09	DC532 / I9
X4 / 1	10	DC532 / I10
X4 / 1	11	DC532 / I11
X4 / 1	12	DC532 / I12
X4 / 1	13	DC532 / I13
X4 / 1	14	DC532 / I14
X4 / 1	15	DC532 / I15
X4 / 1	-0	GND
X4 / 2	Vs+	Voltage supply for electronics system (also for functionality of AX501 and DI501)
X4 / 2	16	DC532 / C16
X4 / 2	17	DC532 / C17
X4 / 2	18	DC532 / C18
X4 / 2	19	DC532 / C19
X4 / 2	20	DC532 / C20
X4 / 2	21	DC532 / C21
X4 / 2	22	DC532 / C22
X4 / 2	23	DC532 / C23
X4 / 2	24	DC532 / C24
X4 / 2	25	DC532 / C25
X4 / 2	26	DC532 / C26
X4 / 2	27	DC532 / C27
X4 / 2	28	DC532 / C28
X4 / 2	29	DC532 / C29
X4 / 2	30	DC532 / C30
X4 / 2	31	DC532 / C31
X4 / 2	V+	Voltage supply of inputs/outputs (module DC532 and auxiliary voltage)
X4 / 3	Vs-	GND

Connector / Block	Pin	Assignment / Signal
X4 / 3	+1	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+2	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+3	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+4	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+5	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+6	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+7	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	+8	Auxiliary voltage (max. 200 mA total load of +0/ +1/ …/ +7/ +8 permitted). Voltage derived from input voltage V+ (X4)
X4 / 3	-1	GND
X4 / 3	-2	GND
X4 / 3	-3	GND
X4 / 3	-4	GND
X4 / 3	-5	GND
X4 / 3	-6	GND
X4 / 3	-7	GND
X4 / 3	-8	GND
X4 / 3	V-	GND

Connection data of spring terminals (X4):

- Conductor cross section, single wire: 0.2 mm² to 2.5 mm²
- Conductor cross section, flexible: 0.2 mm² to 1.5 mm² (existing device: 2.5 mm² flexible)
- Conductor cross section, flexible with wire-end ferrule: 0.25 mm² to 1.5 mm²

51 DC522(-XC)

- DC522
- DC522-XC



CAUTION!

Risk of injury and damaging the product!

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– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

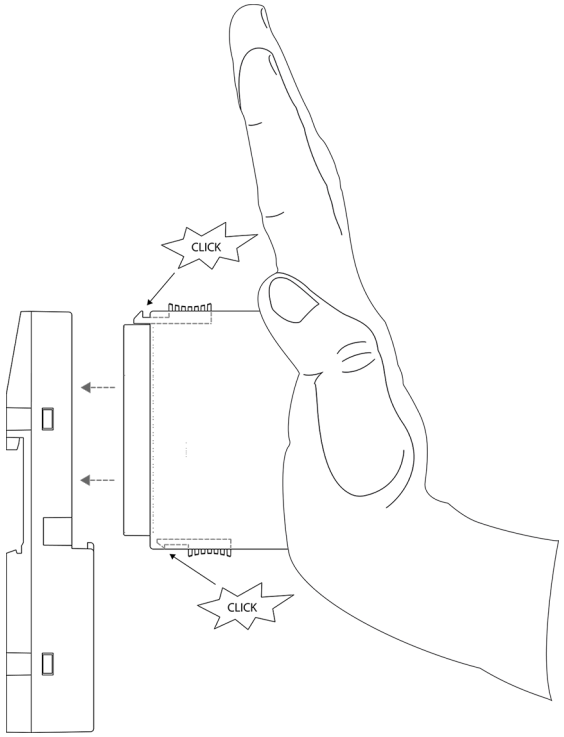
NOTICE!

Hot swap

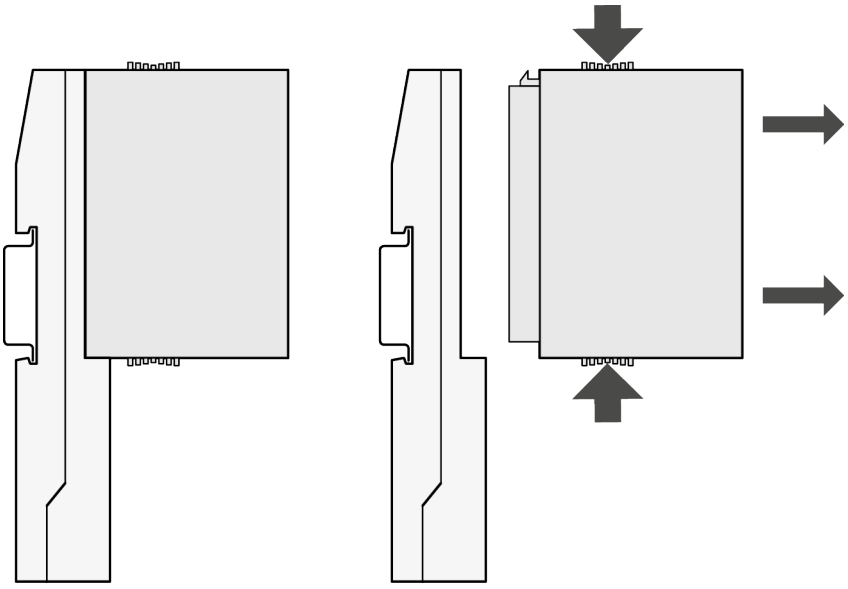
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

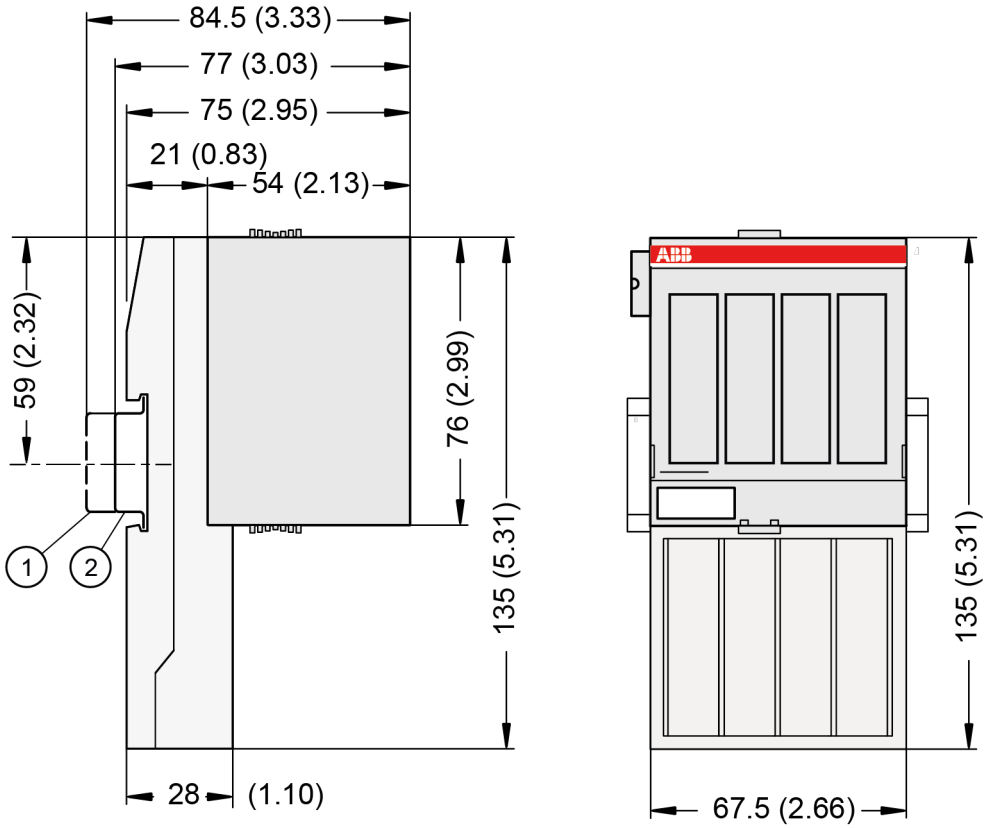
51.1 Assembly



51.2 Disassembly



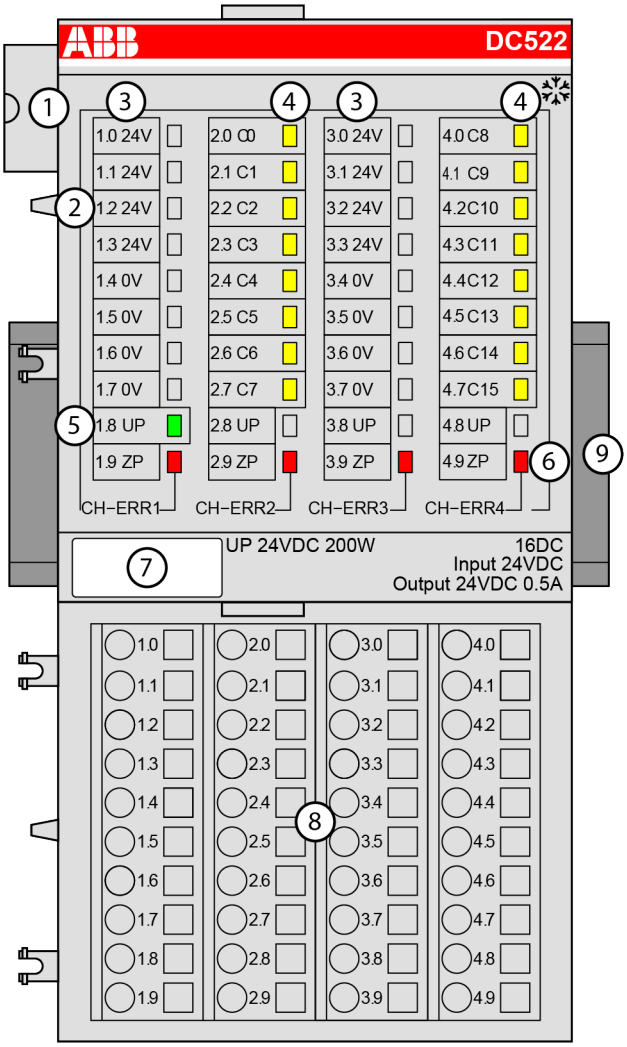
51.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

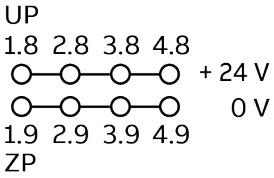
51.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 Sensor power supply 24 V DC / 0.5 A
4 16 yellow LEDs to display the signal states at the digital inputs/outputs (C0 ... C15)
5 1 green LED to display the state of the process supply voltage UP
6 4 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

51.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

51.4.2 Inputs/Outputs

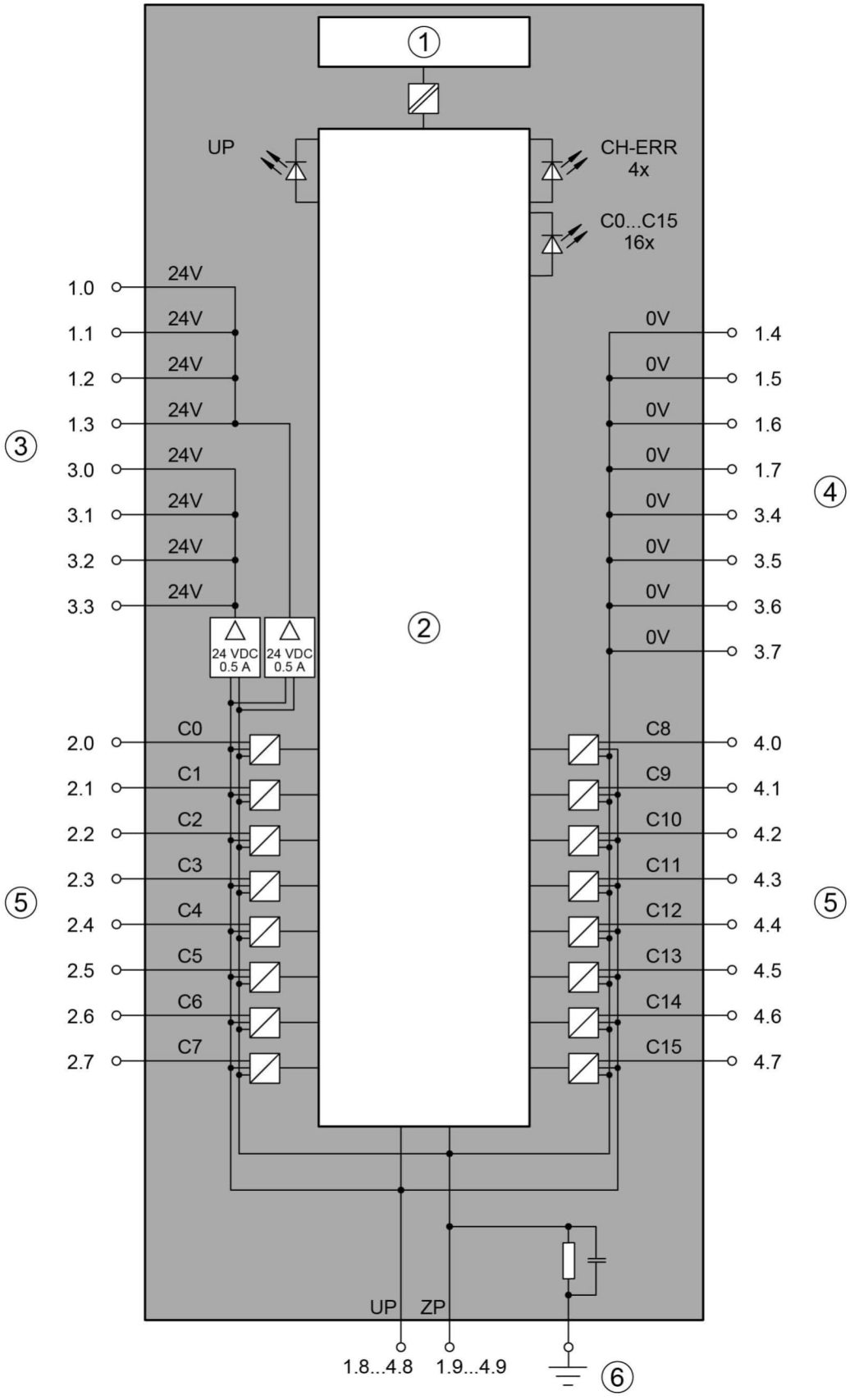
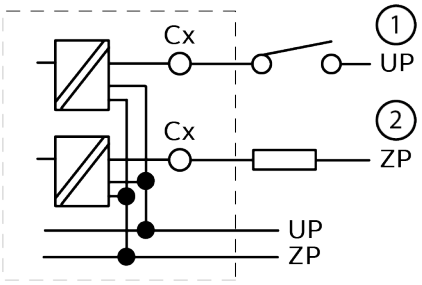


Fig. 78: Input/output channels

1 I/O bus interface
2 Logic

3 Sensor power supply sources
4 0 V
5 Digital inputs/outputs
6 Functional earth connection

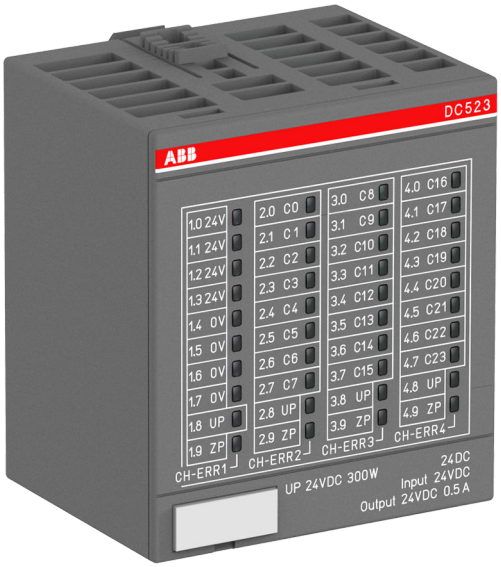
Example



1 Example of connection as an input
2 Example of connection as an output

52 DC523(-XC)

- DC523
- DC523-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

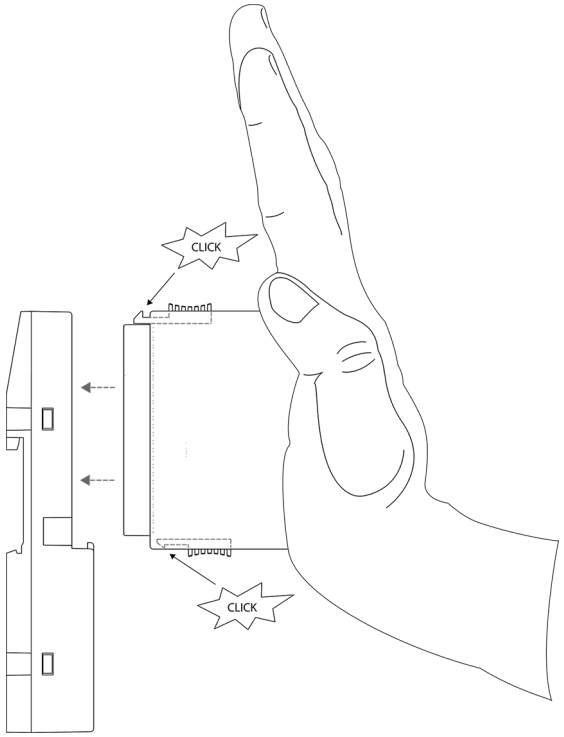
NOTICE!

Hot swap

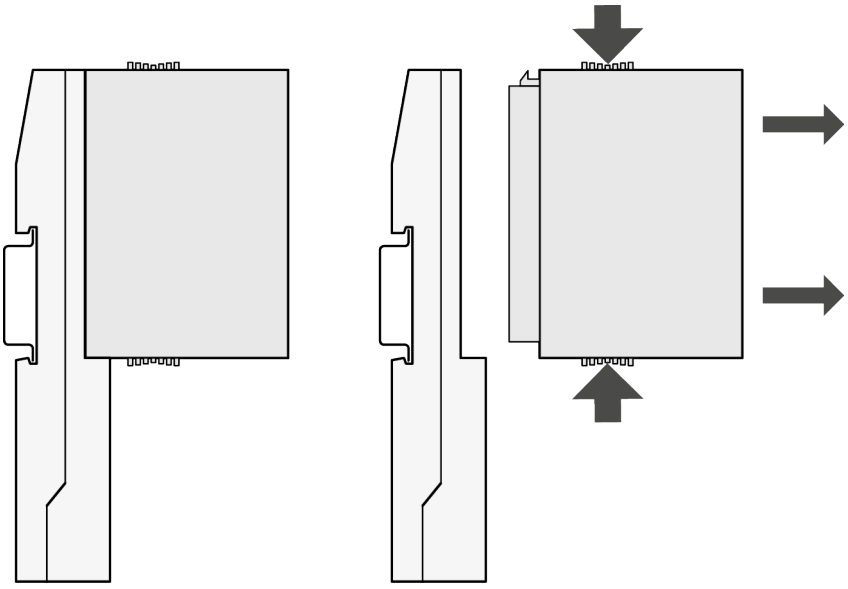
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

↬ *Chapter 4 “PLC System” on page 32*

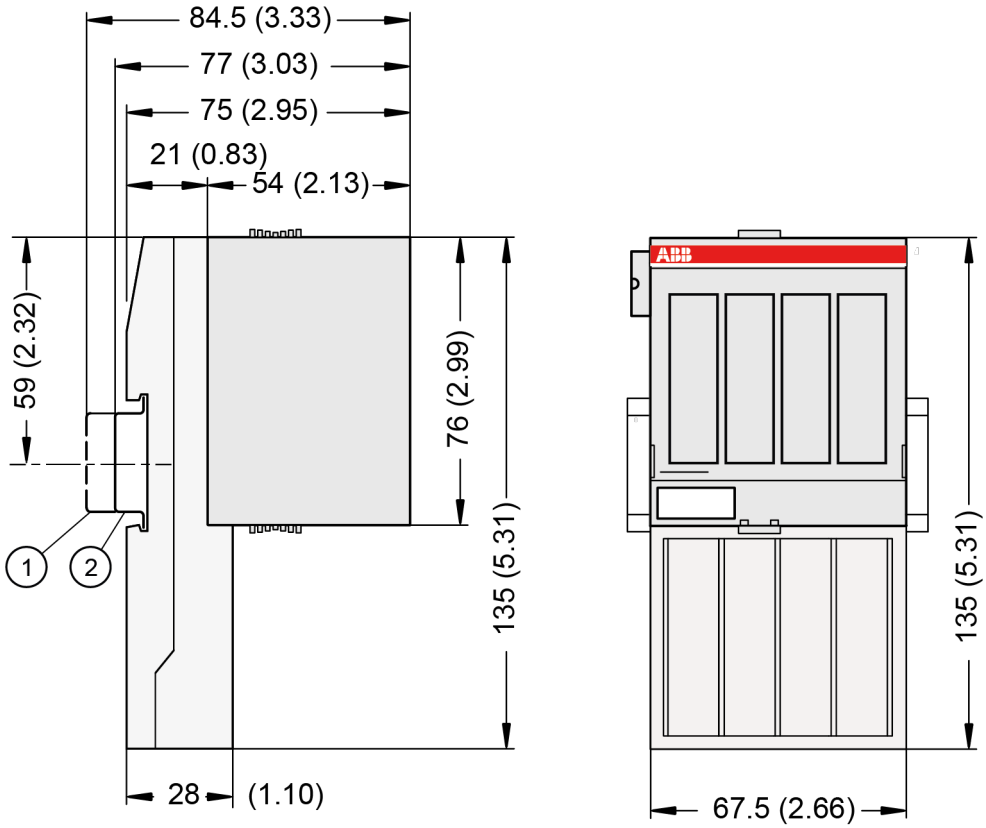
52.1 Assembly



52.2 Disassembly



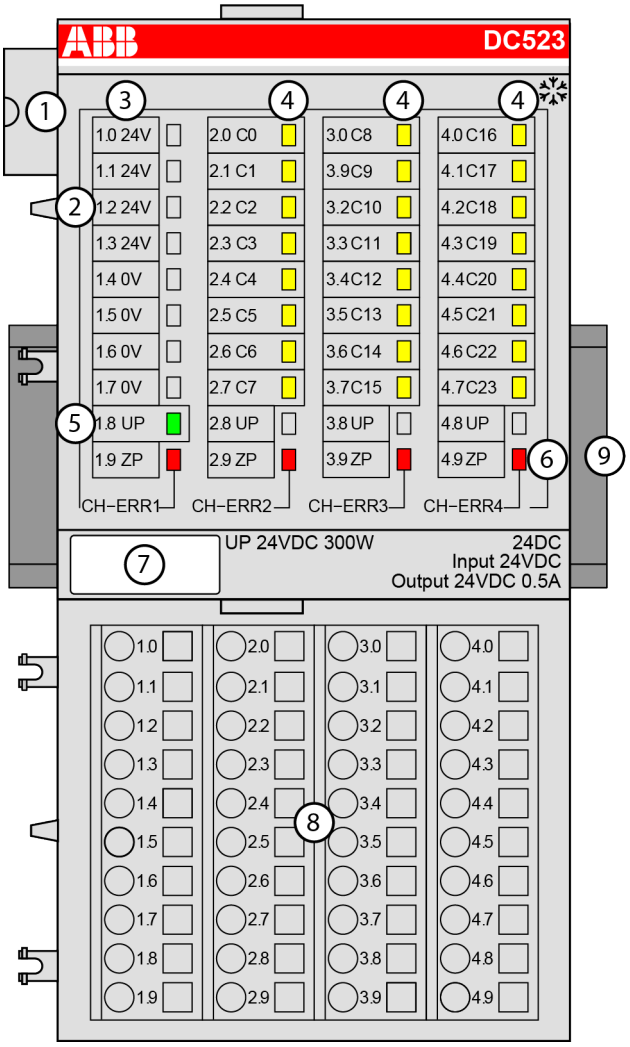
52.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

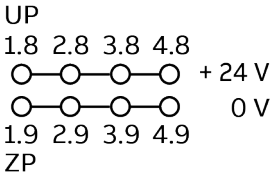
52.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 Sensor power supply 24 V DC / 0.5 A
4 24 yellow LEDs to display the signal states at the digital inputs/outputs (C0 ... C23)
5 1 green LED to display the status of the process supply voltage UP
6 4 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

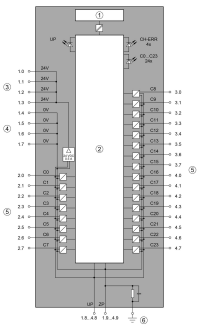
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

52.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

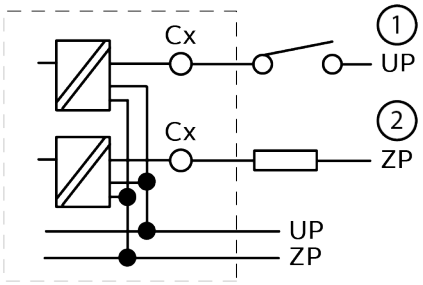
52.4.2 Inputs/Outputs



1 I/O bus interface
2 Logic
3 Sensor power supply sources
4 0 V
5 Digital inputs/outputs
6 Functional earth connection

Fig. 79: Internal construction of the digital inputs and outputs

Example



1 Example of connection as an input
2 Example of connection as an output

53 DC532(-XC)

- DC532
- DC532-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

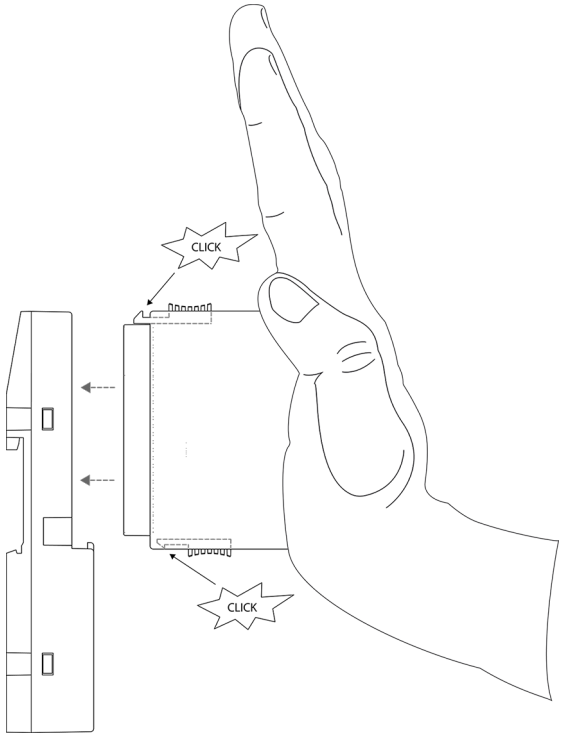
NOTICE!

Hot swap

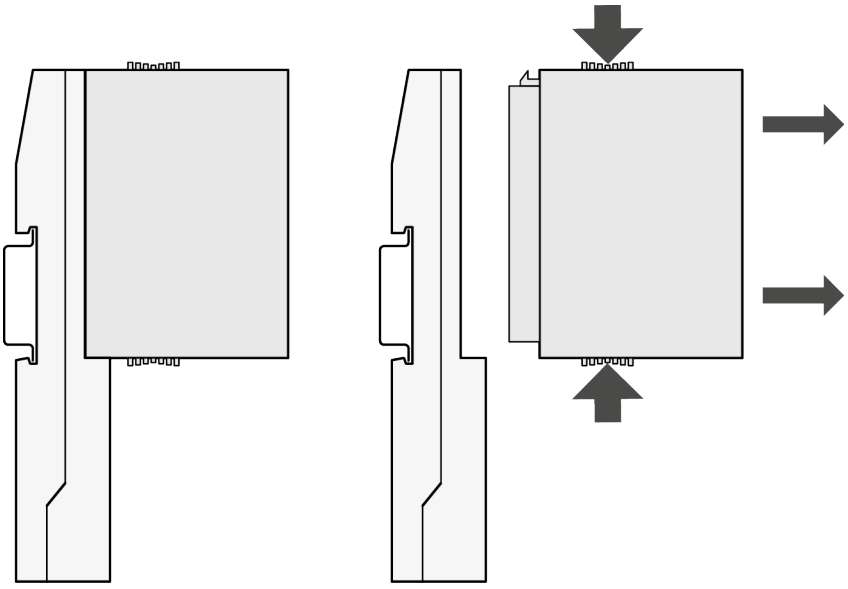
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

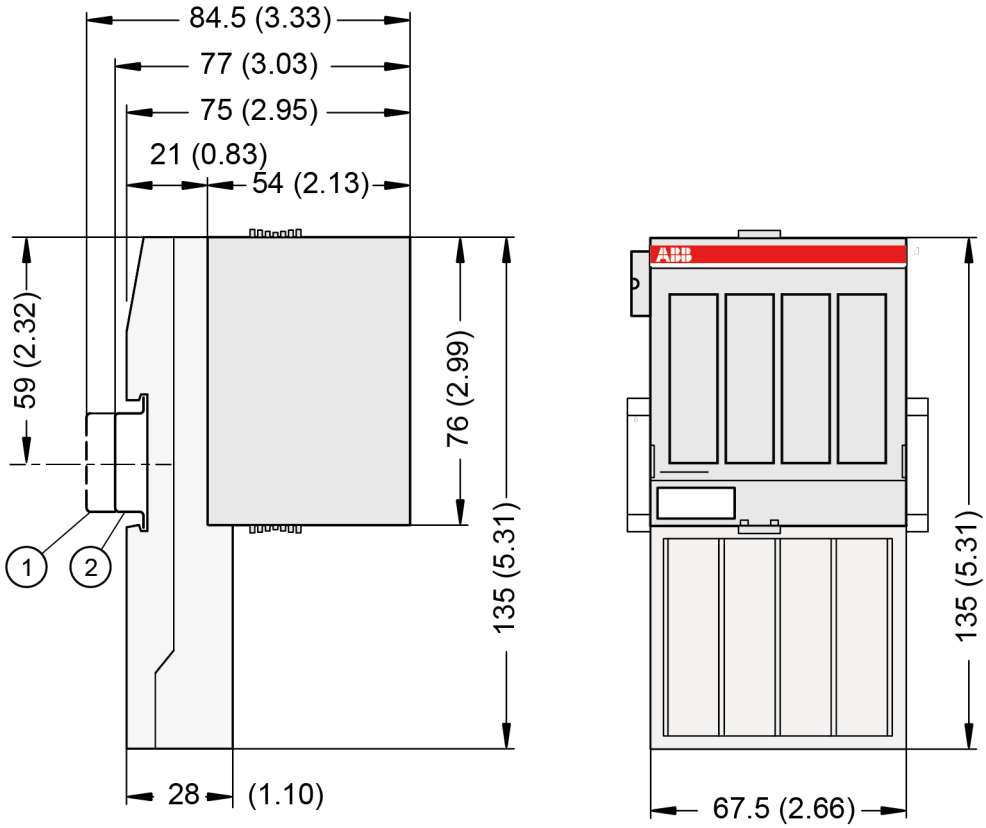
53.1 Assembly



53.2 Disassembly



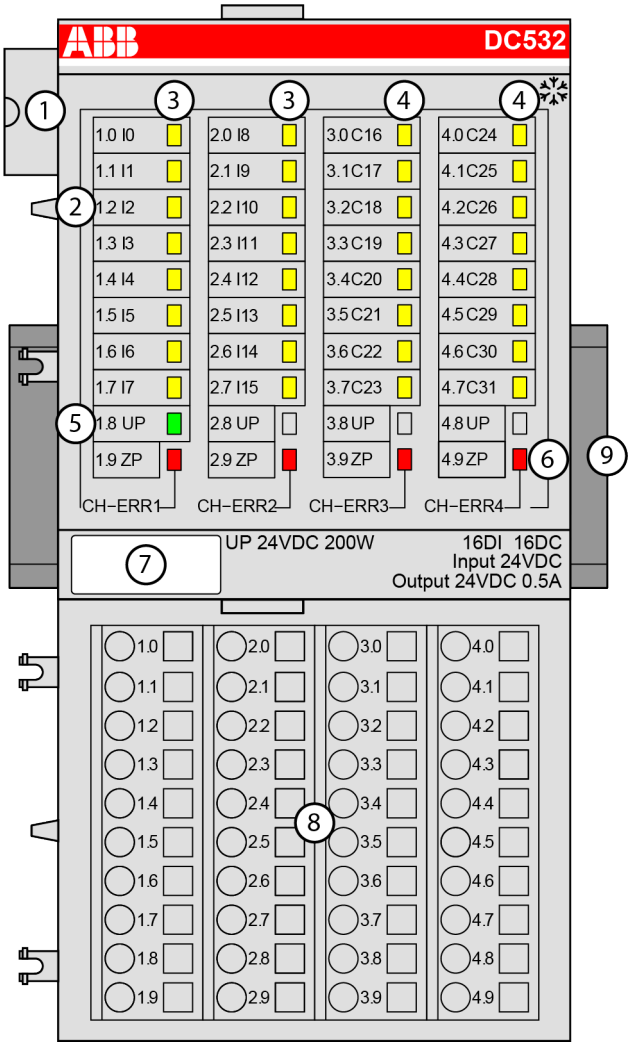
53.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

> *The dimensions are in mm and in brackets in inch.*

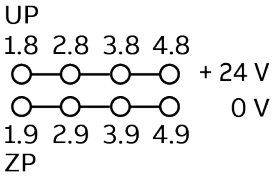
53.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 16 yellow LEDs to display the signal states at the digital inputs (I0 ... I15)
4 16 yellow LEDs to display the signal states at the digital inputs/outputs (C16 ... C31)
5 1 green LED to display the state of the process supply voltage UP
6 4 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

53.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

53.4.2 Inputs/Outputs

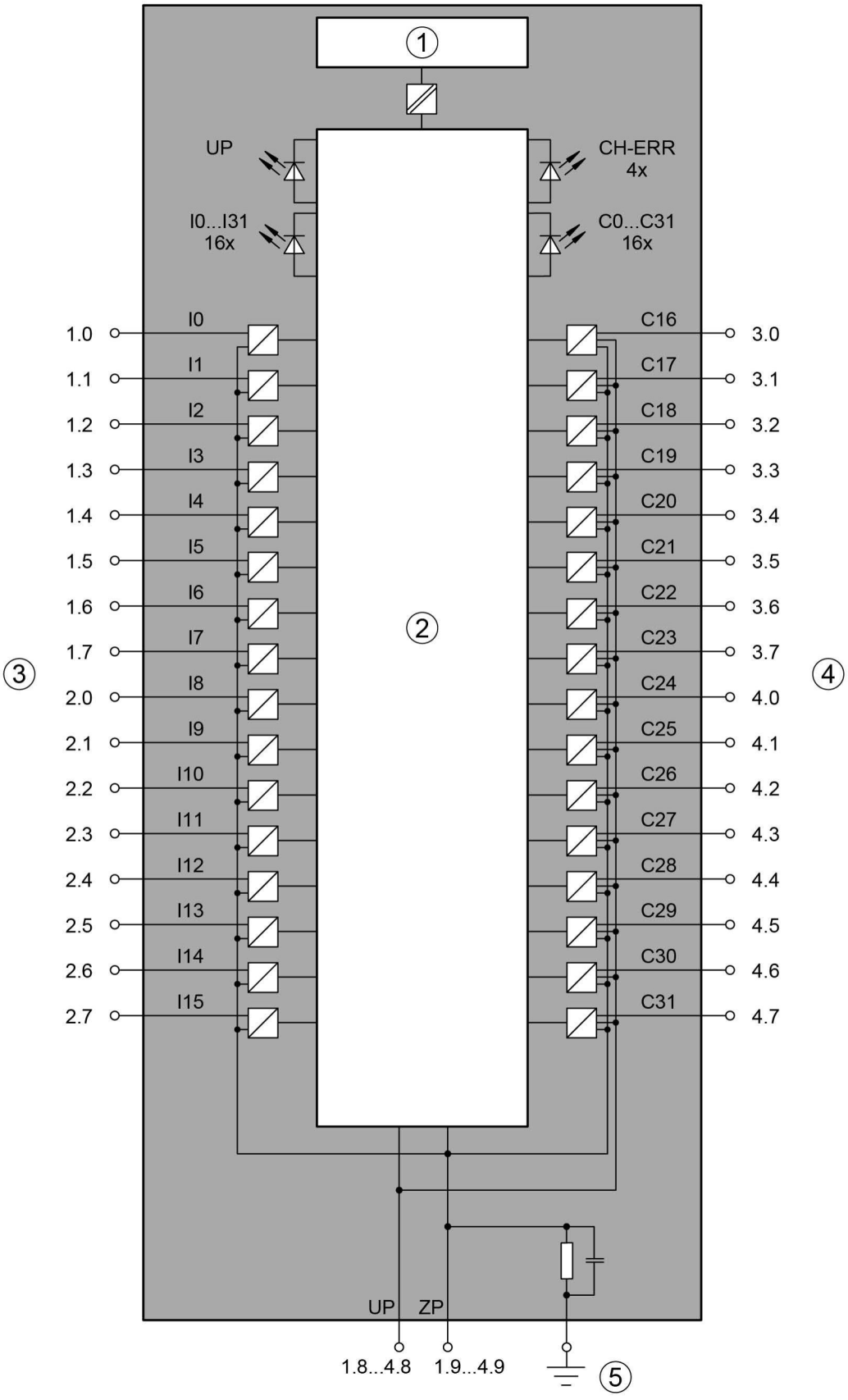


Fig. 80: Input/output channels

1 I/O bus interface
2 Logic

3 Digital inputs
4 Digital inputs/outputs
5 Functional earth connection

Example

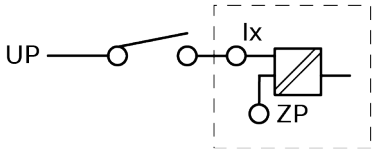
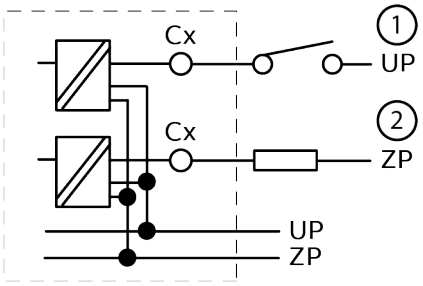


Fig. 81: Example of connection input Ix

Example



1 Example of connection as an input
2 Example of connection as an output

54 DC541-CM(-XC)

- DC541-CM
- DC541-CM-XC



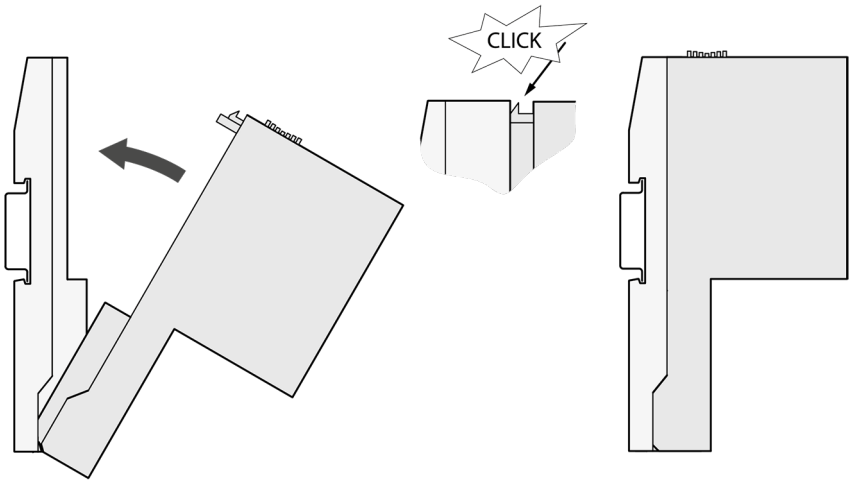
CAUTION!

Risk of injury and damaging the product!

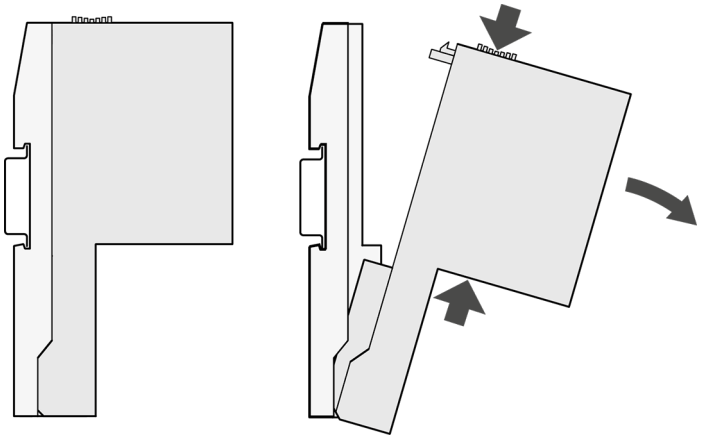
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

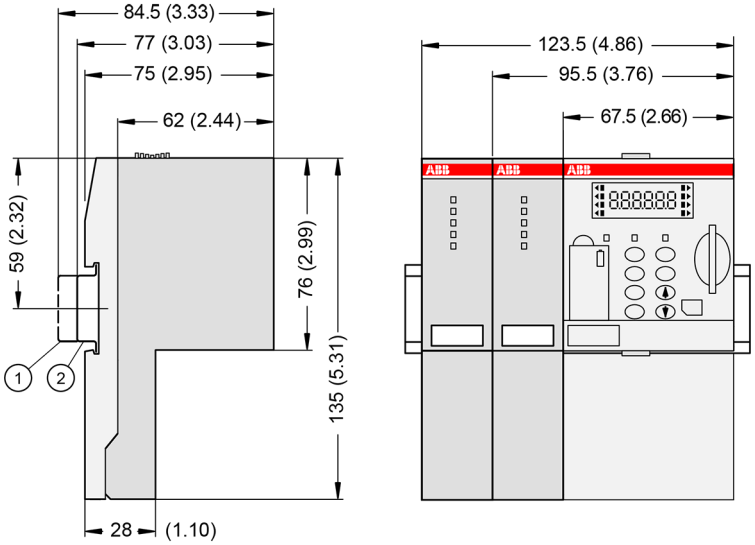
54.1 Assembly



54.2 Disassembly



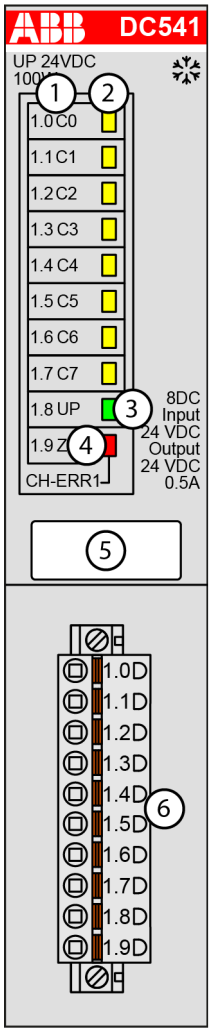
54.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

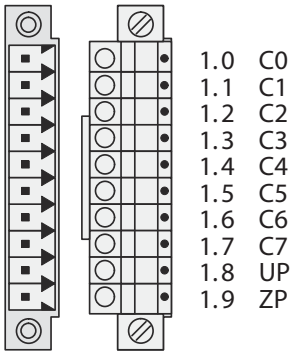
The dimensions are in mm and in brackets in inch.

54.4 Connections

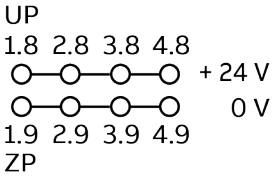


1 Allocation between terminal number and signal name
2 8 yellow LEDs to display the signal states at the inputs/outputs C0 ... C7
3 1 green LED to display the state of the process supply voltage UP
4 1 red LED to display errors (CH-ERR1)
5 Label
6 Terminal block with 10 terminals for 8 inputs/outputs and process power supply (ZP/UP)
❄ Sign for XC version

Terminal unit

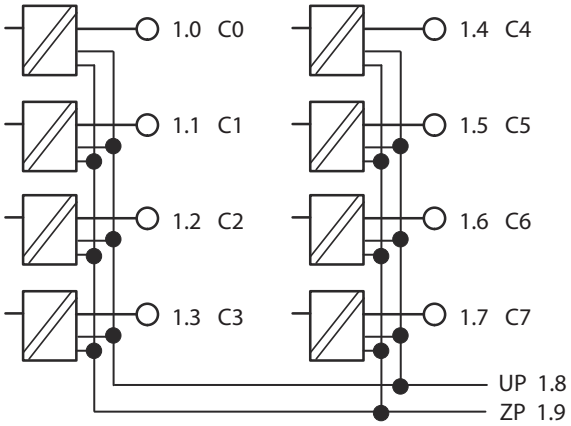


54.4.1 Process supply voltage

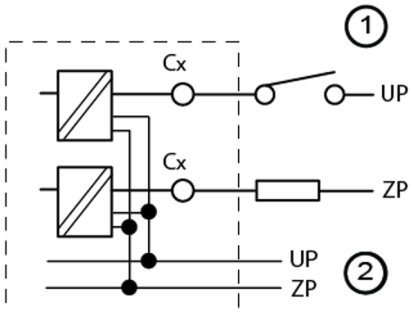


CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

54.4.2 Inputs/Outputs



Examples



1 Example for connection as an input
2 Example for connection as an output

55 DC551-CS31(-XC)

- DC551-CS31
- DC551-CS31-XC



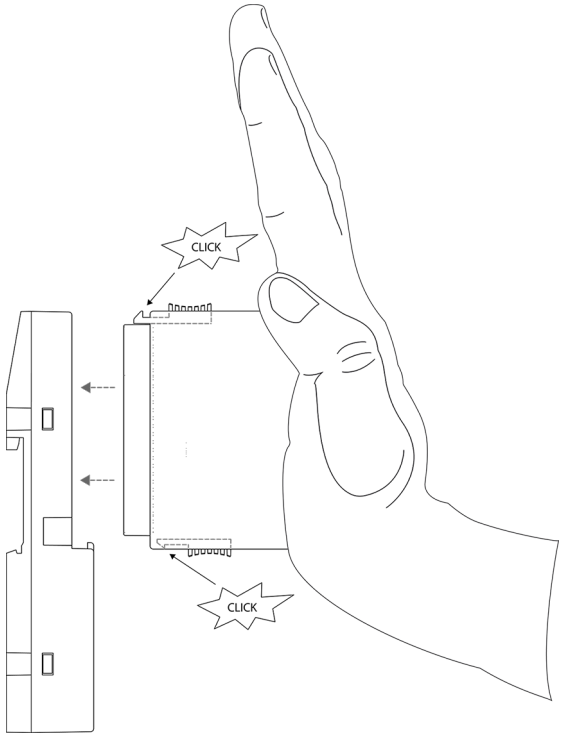
CAUTION!

Risk of injury and damaging the product!

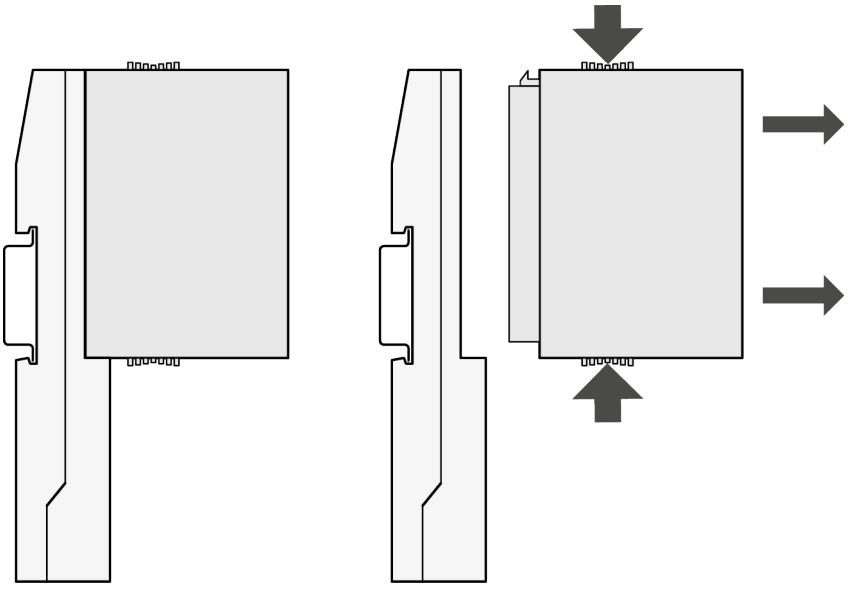
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

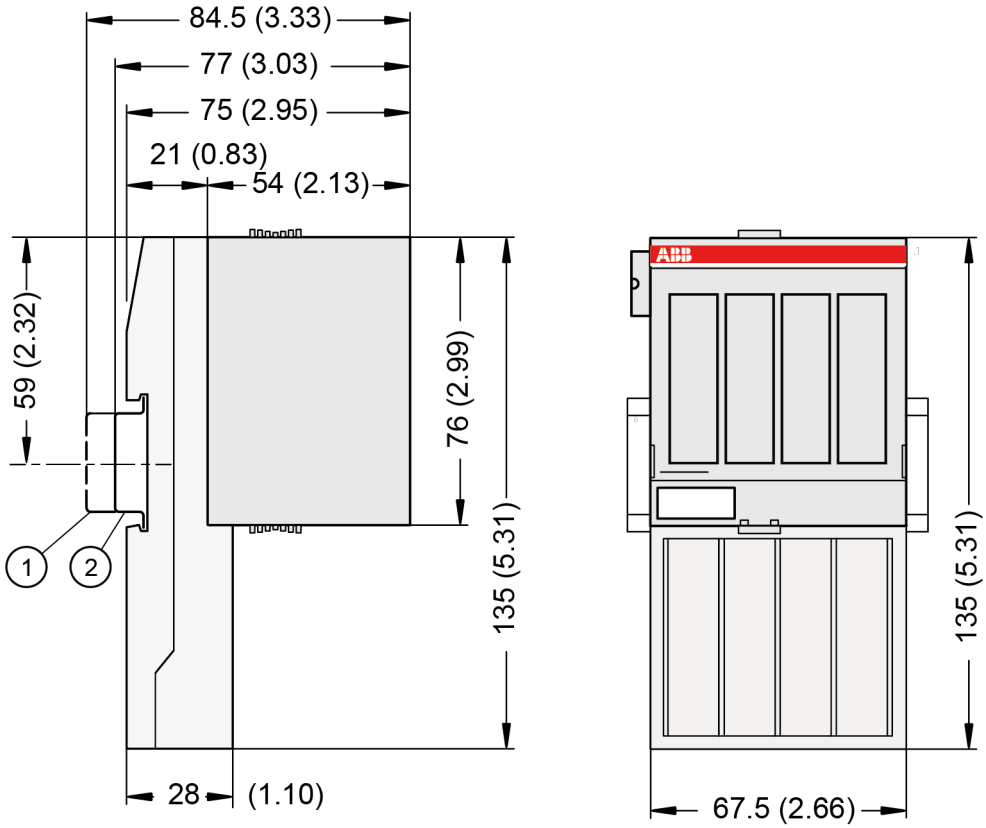
55.1 Assembly



55.2 Disassembly



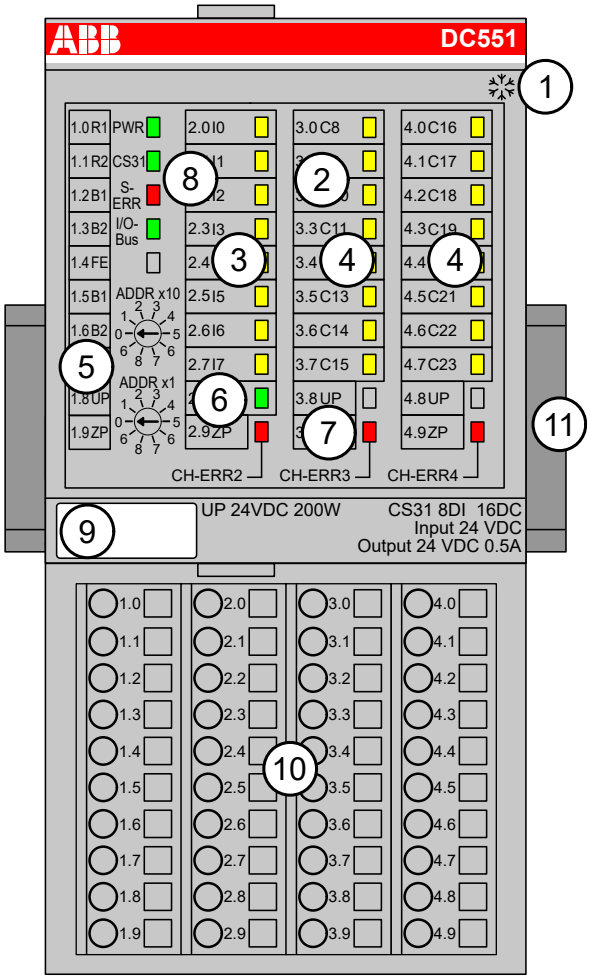
55.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

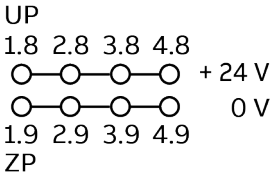
55.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the digital inputs I0 ... I7
4 16 yellow LEDs to display the signal states of the digital inputs/outputs C8 ... C23
5 2 rotary switches to set the module's address (00d ... 99d)
6 1 green LED to display the process voltage UP
7 3 red LEDs to display errors
8 4 system LEDs
9 Label
10 Terminal unit
11 DIN rail
❄ Sign for XC version

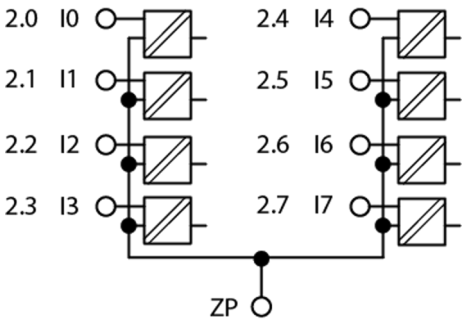
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

55.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

55.4.2 Inputs



Example

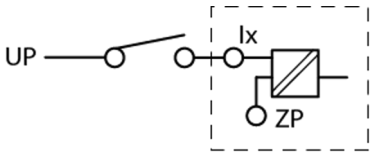
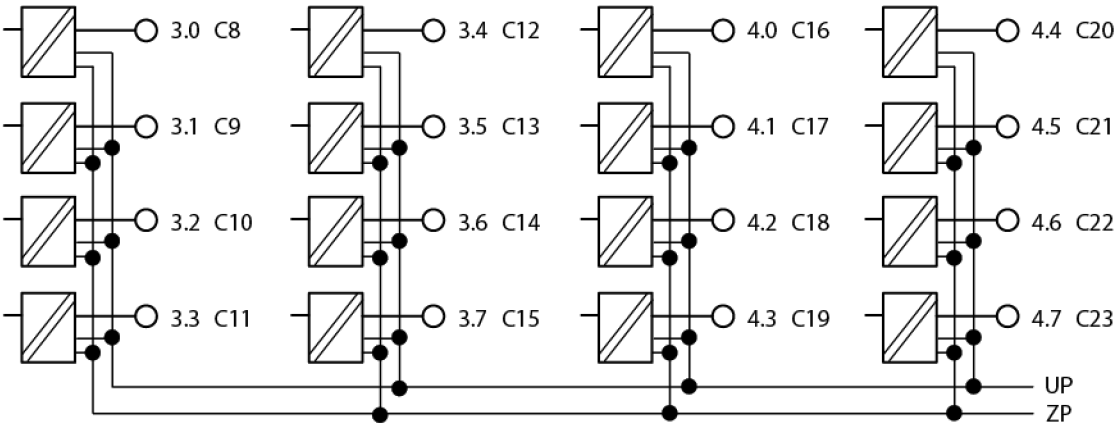
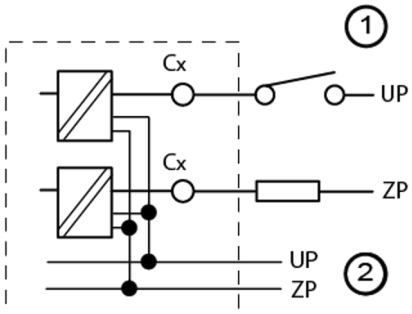


Fig. 82: Example for connection input Ix

55.4.3 Inputs/Outputs



Example



1 Example of connection as an input
2 Example of connection as an output

56 DC562

- DC562



CAUTION!

Risk of injury and damaging the product!

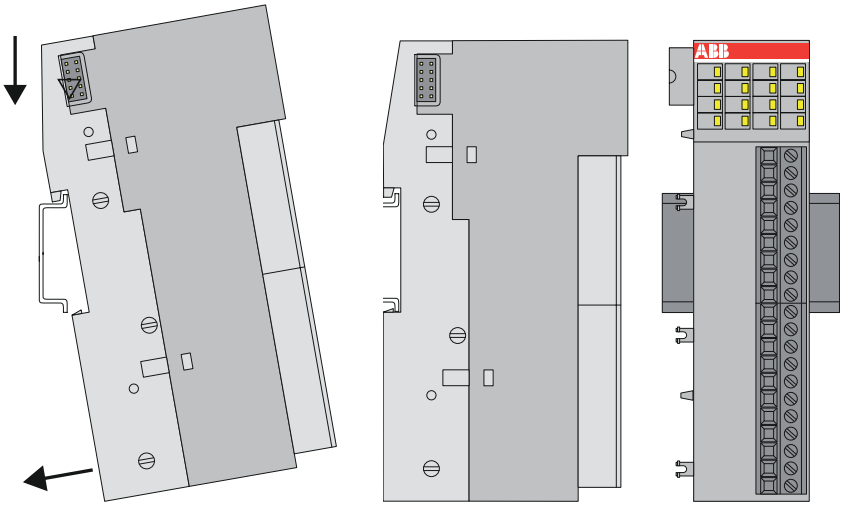
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

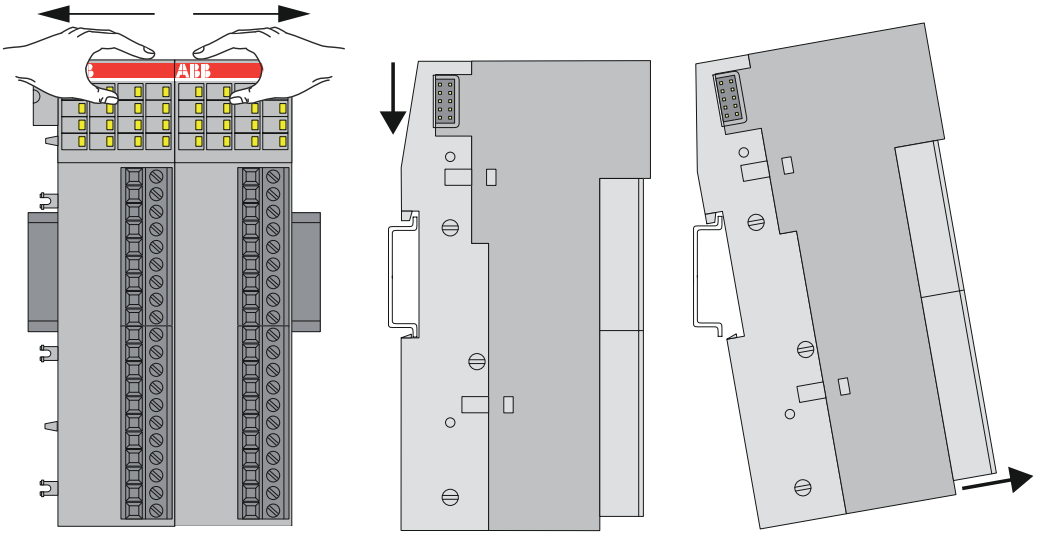
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

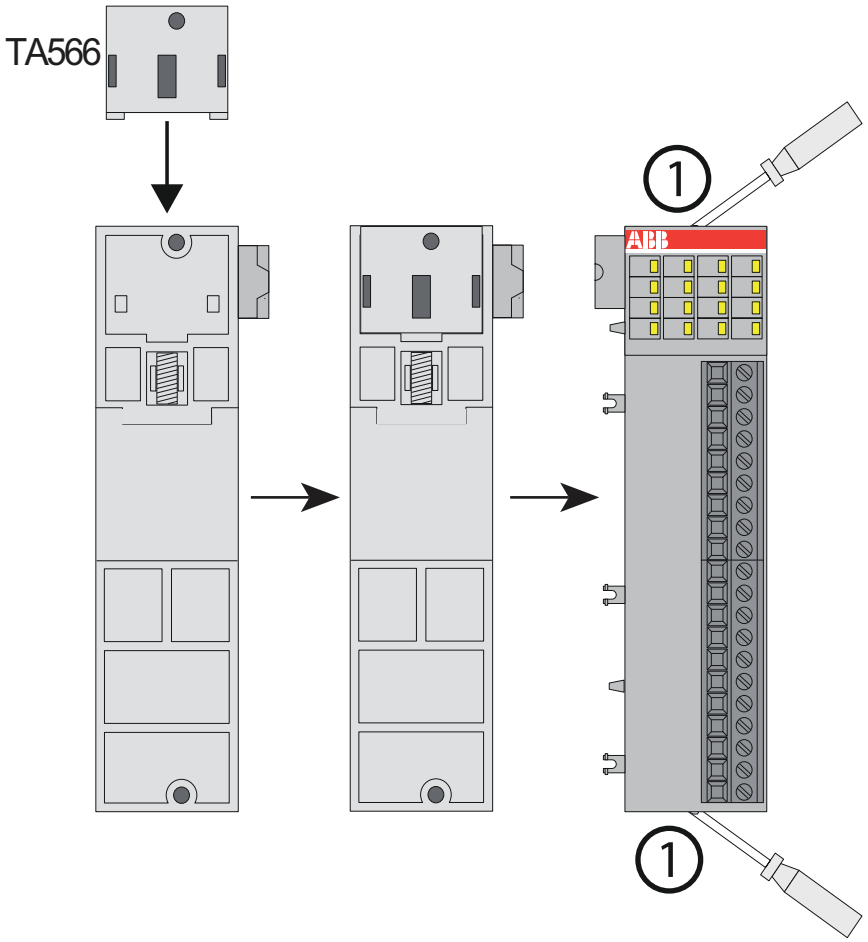
56.1 Assembly



56.2 Disassembly



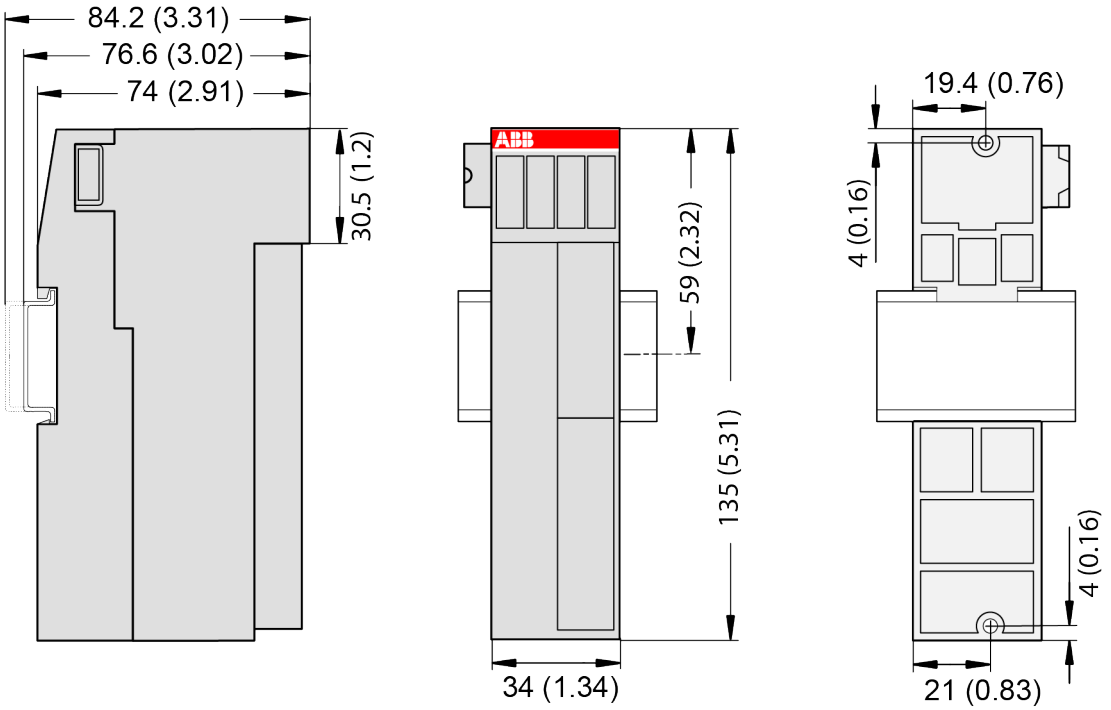
56.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

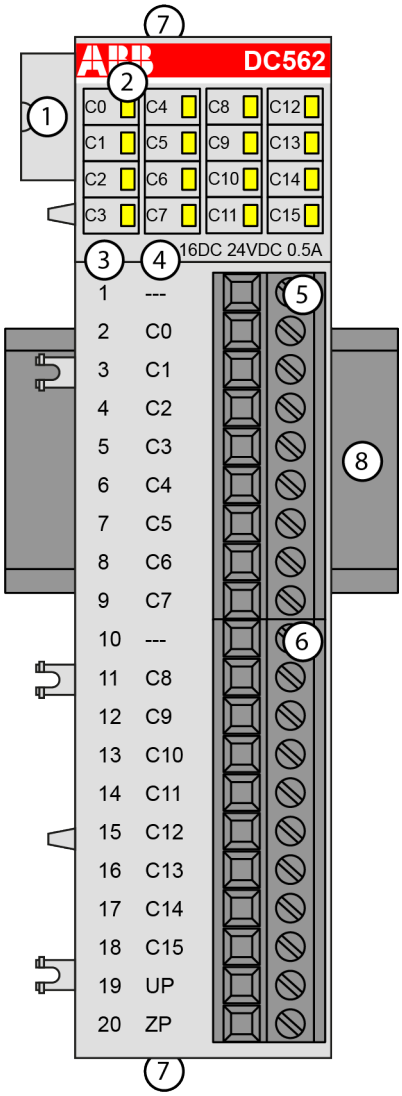
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

56.4 Dimensions



The dimensions are in mm and in brackets in inch.

56.5 Connections



1 I/O bus
2 16 yellow LEDs to display the states of the inputs/outputs C0 ... C15
3 Terminal number
4 Allocation of signal name
5 Terminal block for input and output signals (9-pin)
6 Terminal block for input and output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

56.5.1 Inputs/Outputs

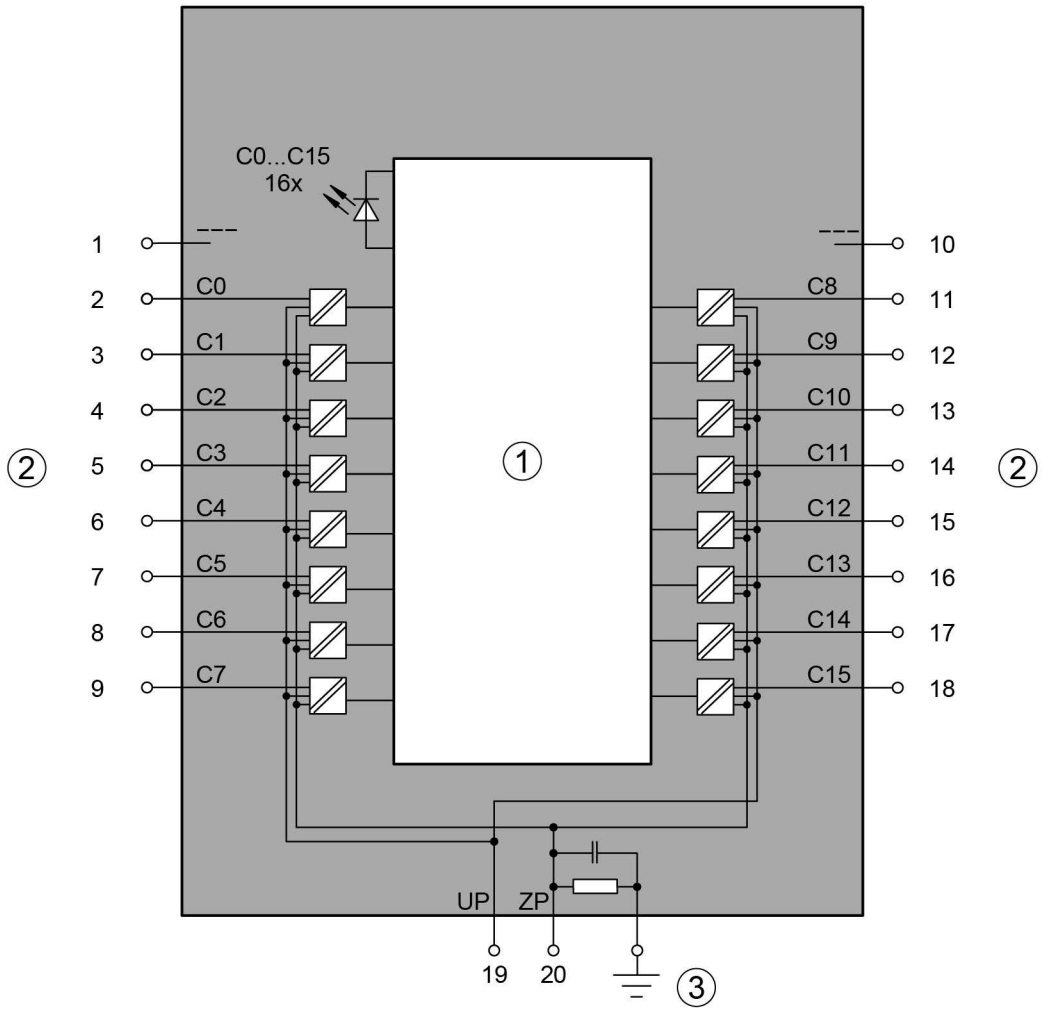
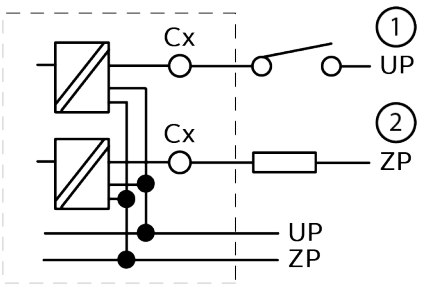


Fig. 83: Internal construction of the digital inputs and outputs

1 Logic - I/O bus interface
2 Digital inputs/outputs
3 Functional earth connection

Examples



1 Example for connection as an input
2 Example for connection as an output

57 DI524(-XC)

- DI524
- DI524-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

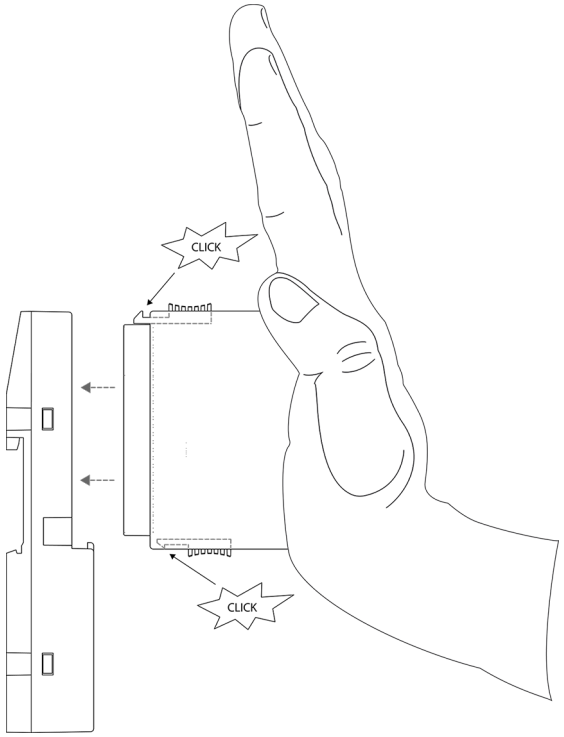
NOTICE!

Hot swap

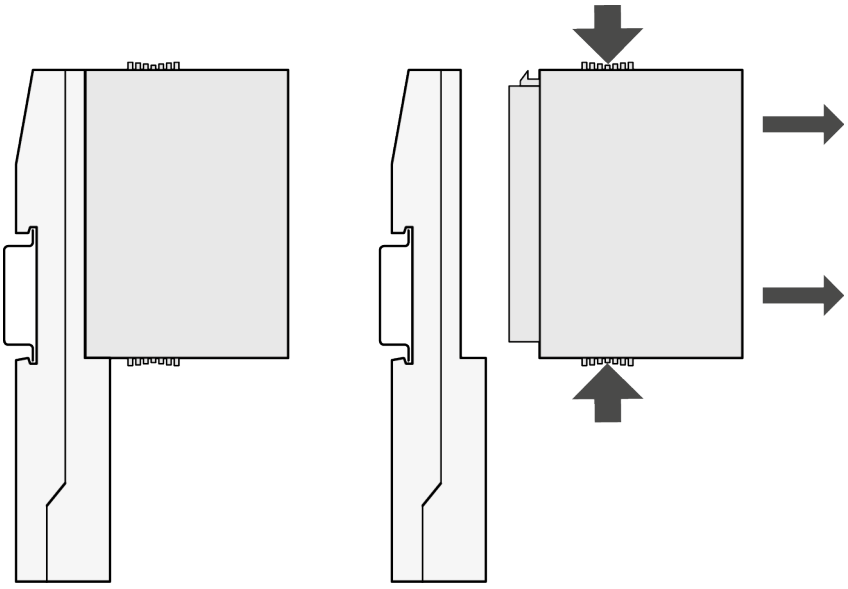
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

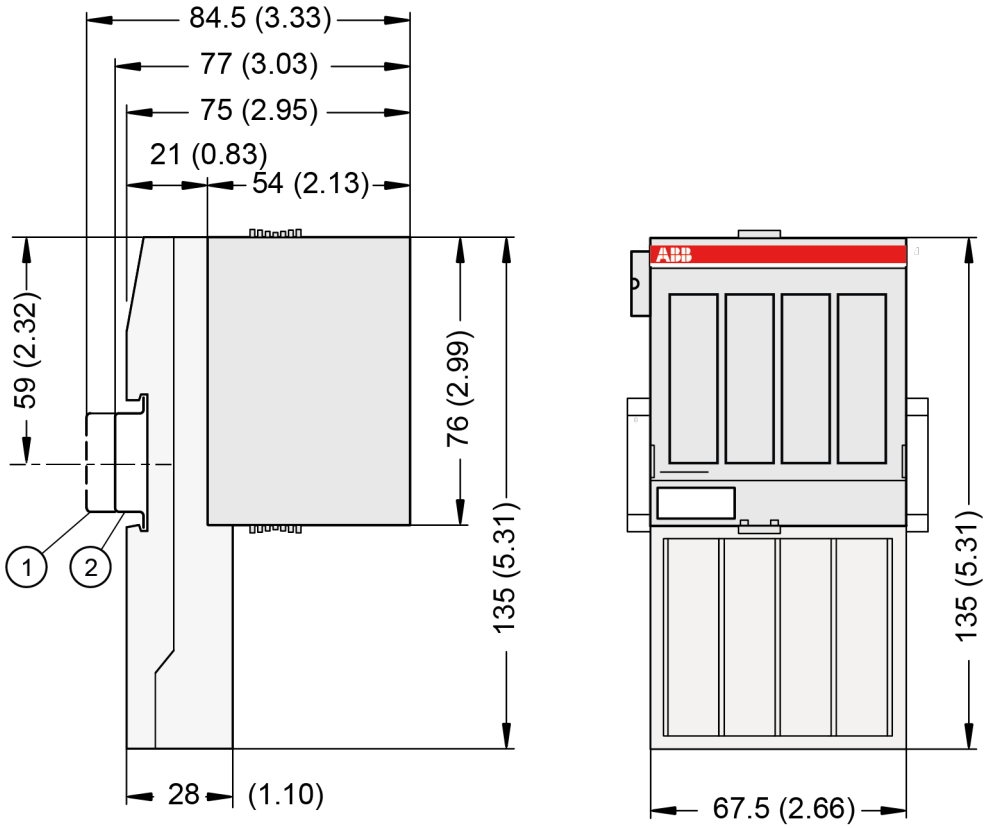
57.1 Assembly



57.2 Disassembly



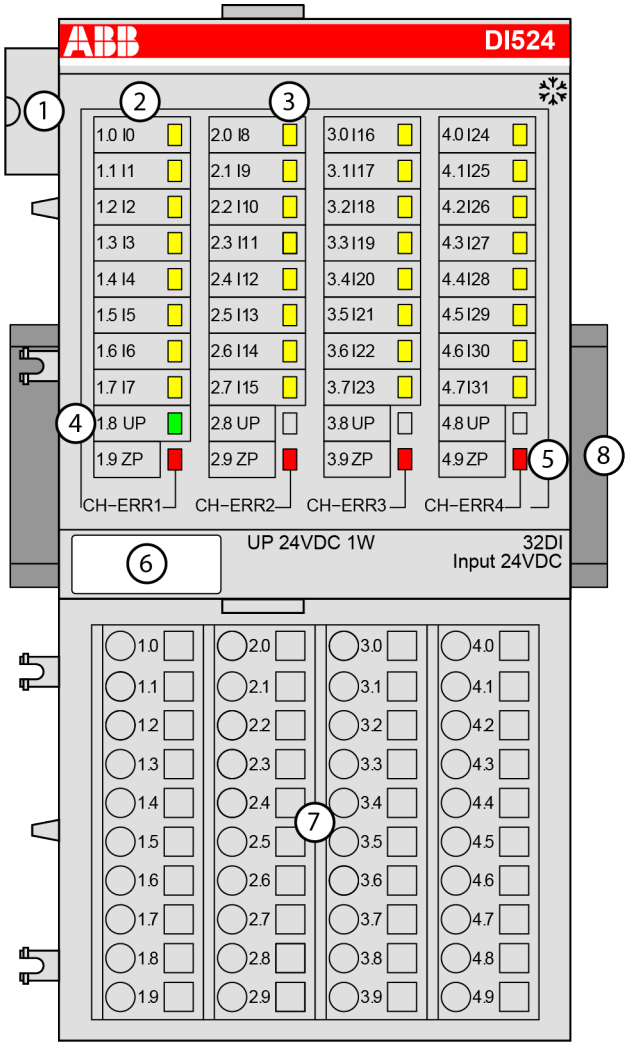
57.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

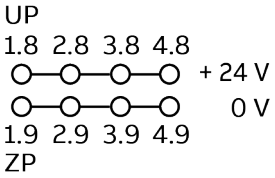
57.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 32 yellow LEDs to display the signal states at the digital inputs (I0 ... I31)
4 1 green LED to display the state of the process supply voltage UP
5 4 red LEDs to display errors
6 Label
7 Terminal unit
8 DIN rail
❄ Sign for XC version

> *All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.*

57.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

57.4.2 Inputs

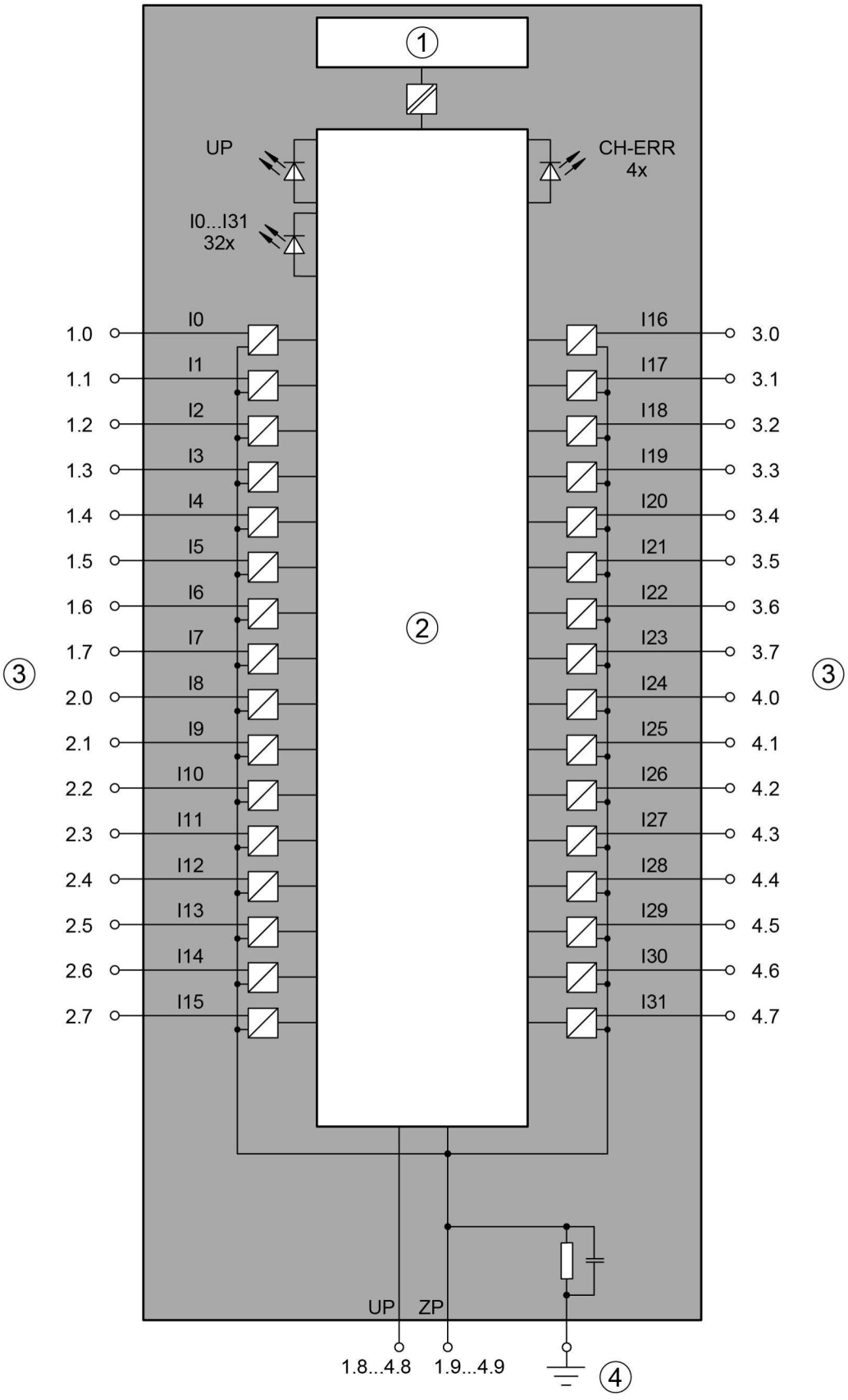


Fig. 84: Internal construction of the digital inputs

1 I/O bus interface
2 Logic
3 Digital inputs
4 Functional earth connection

Example

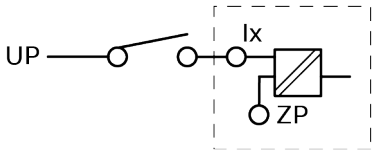


Fig. 85: Example of connection input Ix

58 DI561

- DI561



CAUTION!

Risk of injury and damaging the product!

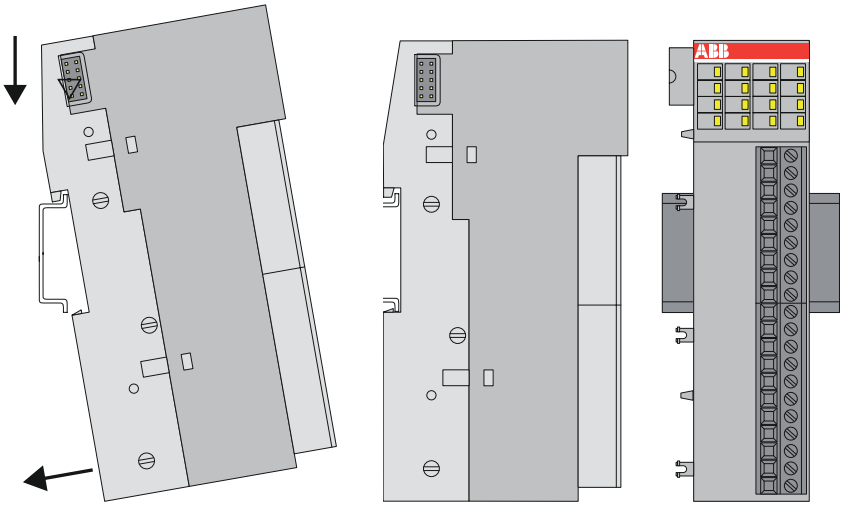
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

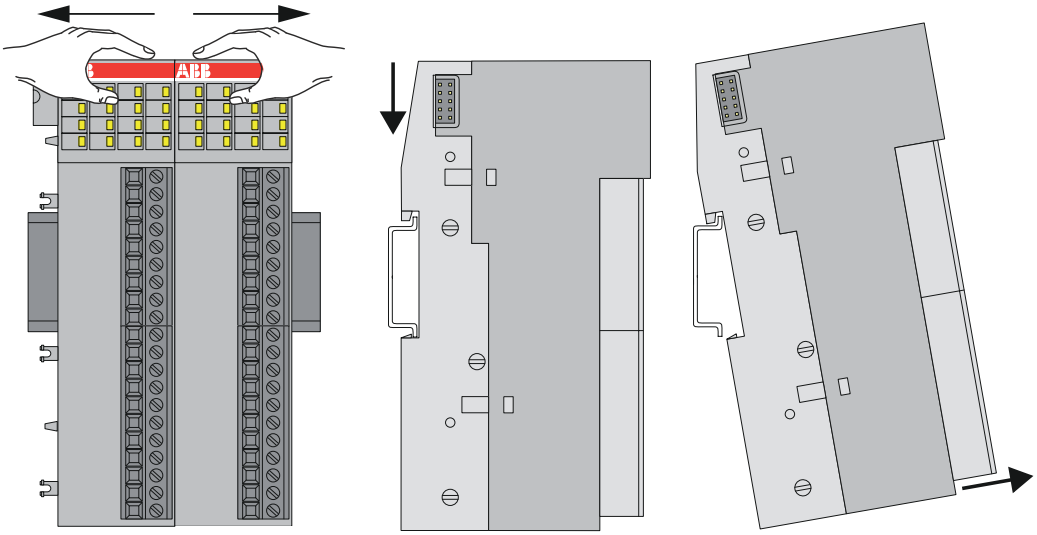
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

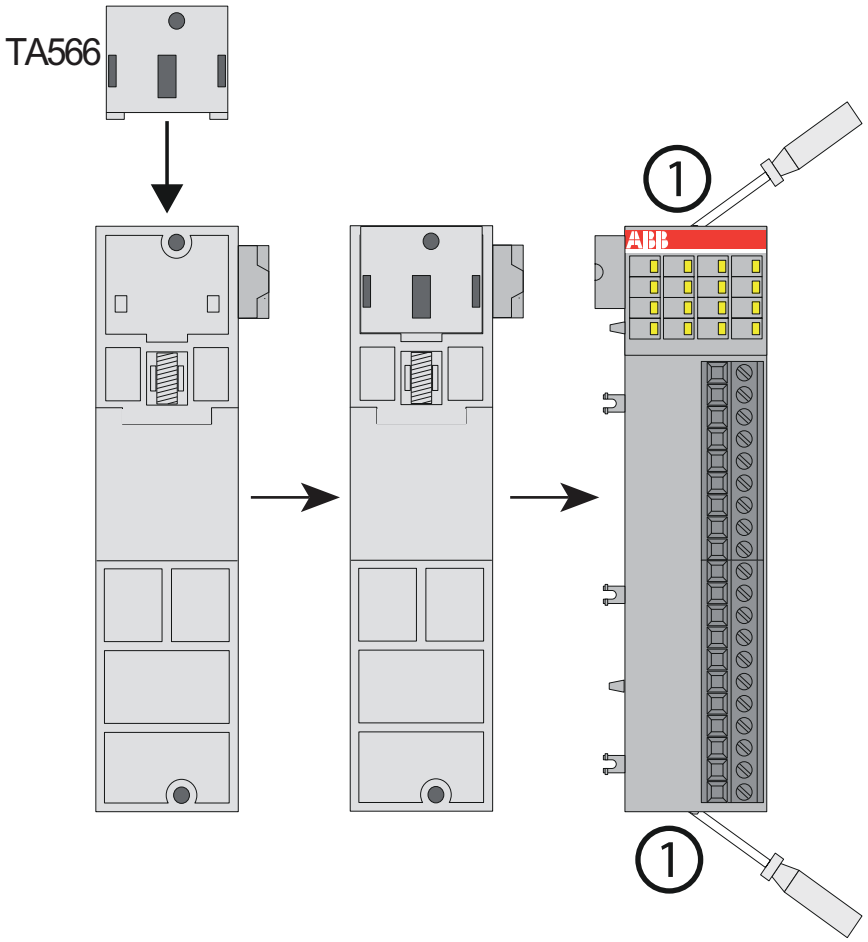
58.1 Assembly



58.2 Disassembly



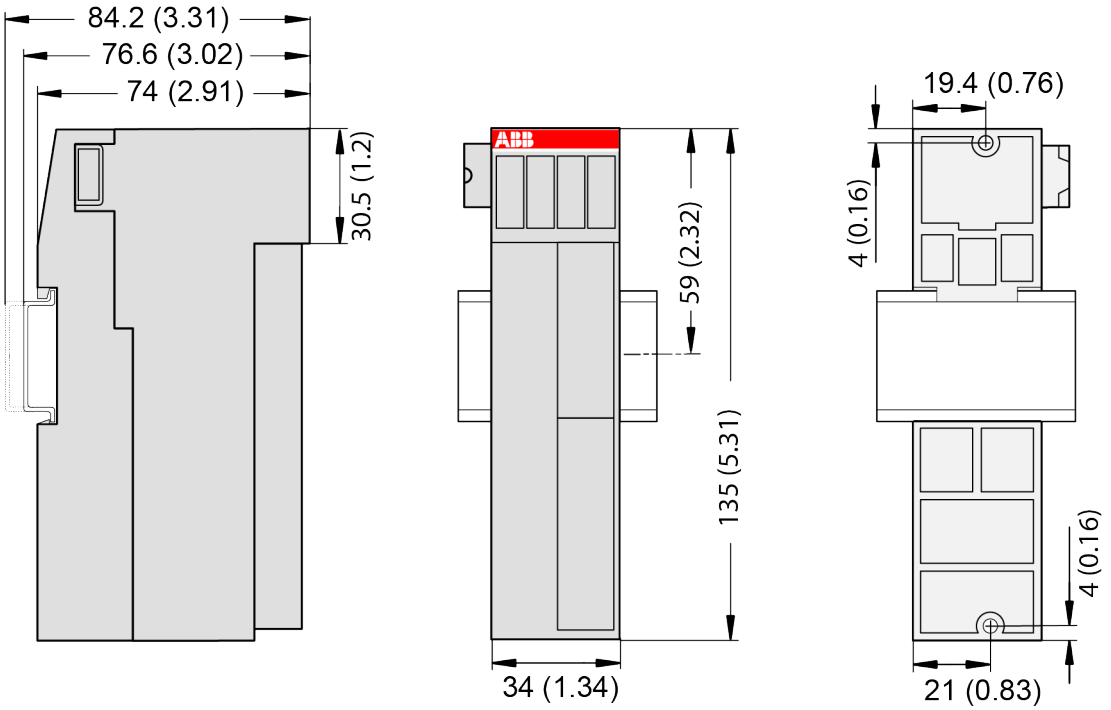
58.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

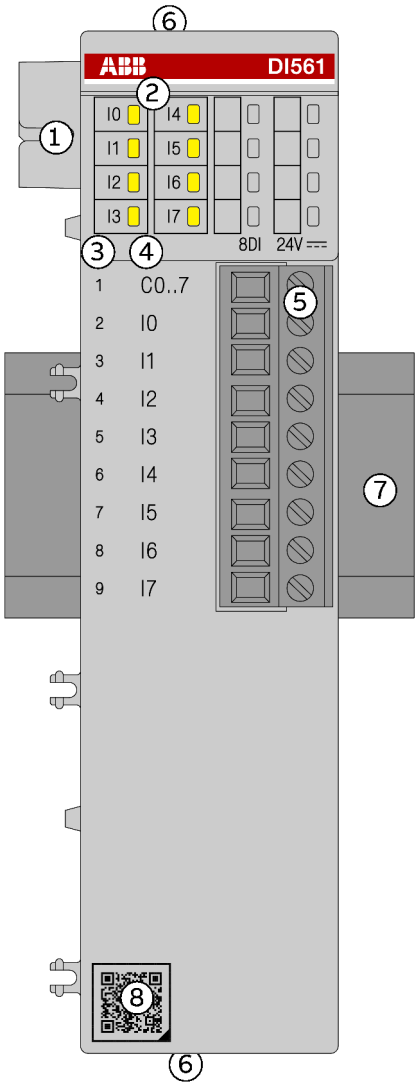
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

58.4 Dimensions



The dimensions are in mm and in brackets in inch.

58.5 Connections



1 I/O bus
2 8 yellow LEDs to display the signal states of the inputs I0 to I7
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 2 holes for wall-mounting with screws
7 DIN rail
8 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

58.5.1 Inputs/Outputs

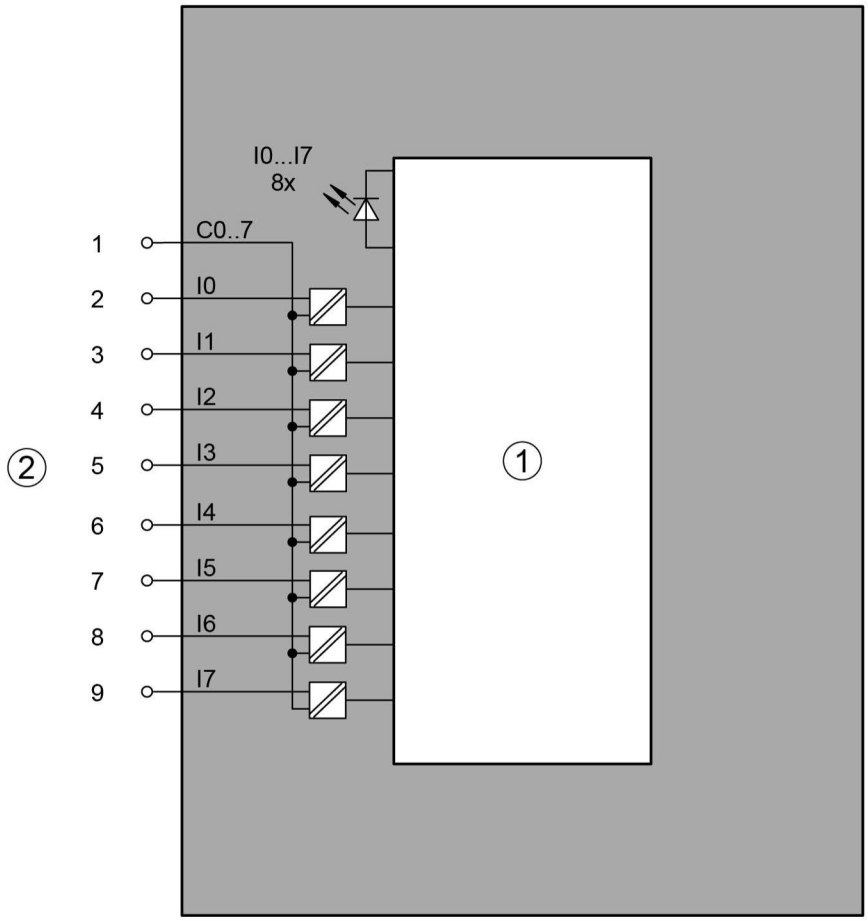


Fig. 86: Internal construction of the digital inputs

1 Logic - I/O bus interface
2 Digital inputs

Examples

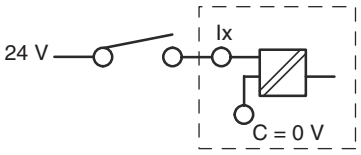


Fig. 87: DI561 used as source inputs

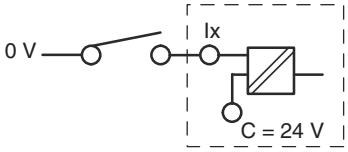


Fig. 88: DI561 used as sink inputs

59 DI562

- DI562



CAUTION!

Risk of injury and damaging the product!

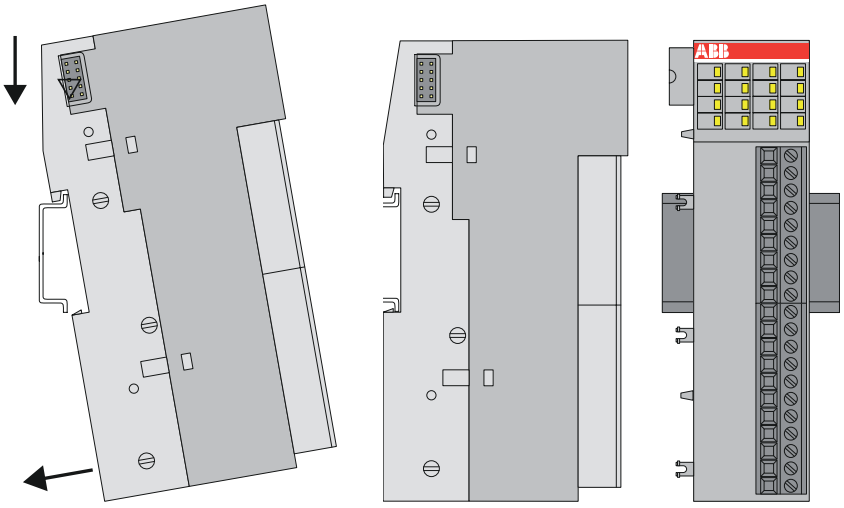
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

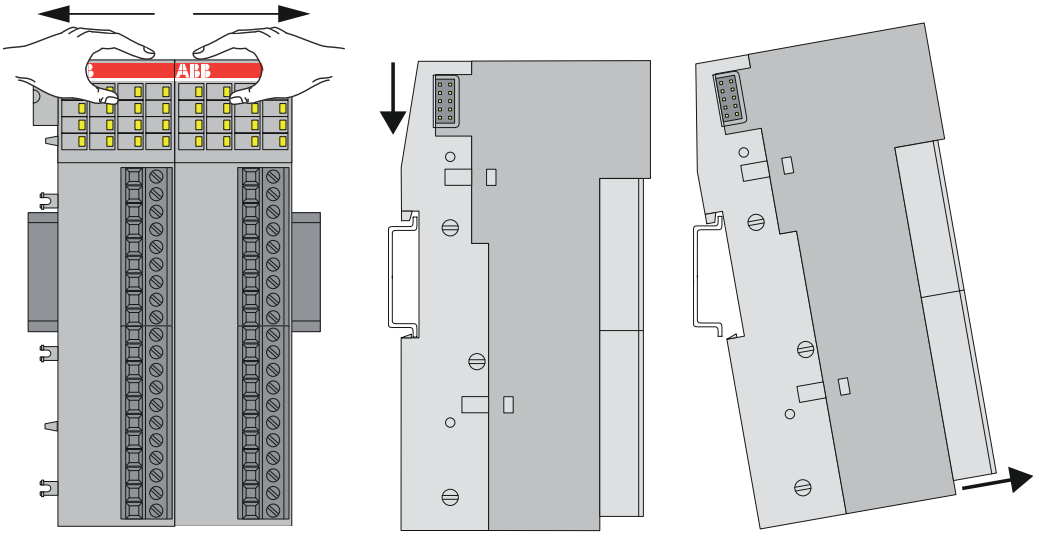
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

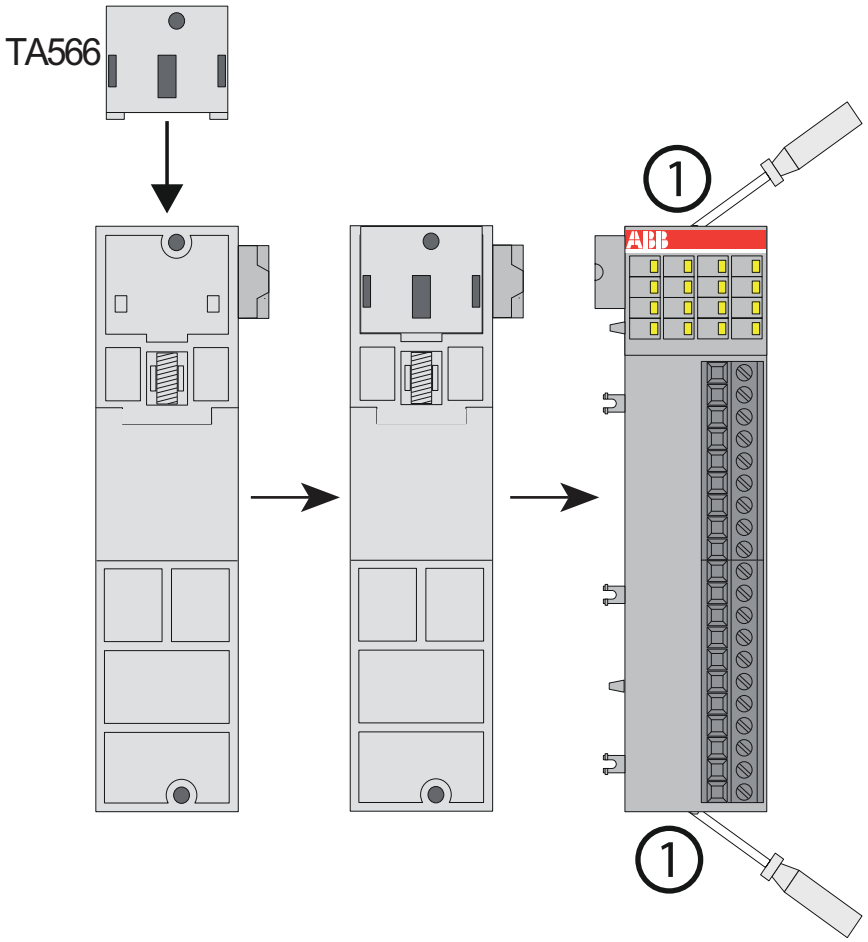
59.1 Assembly



59.2 Disassembly



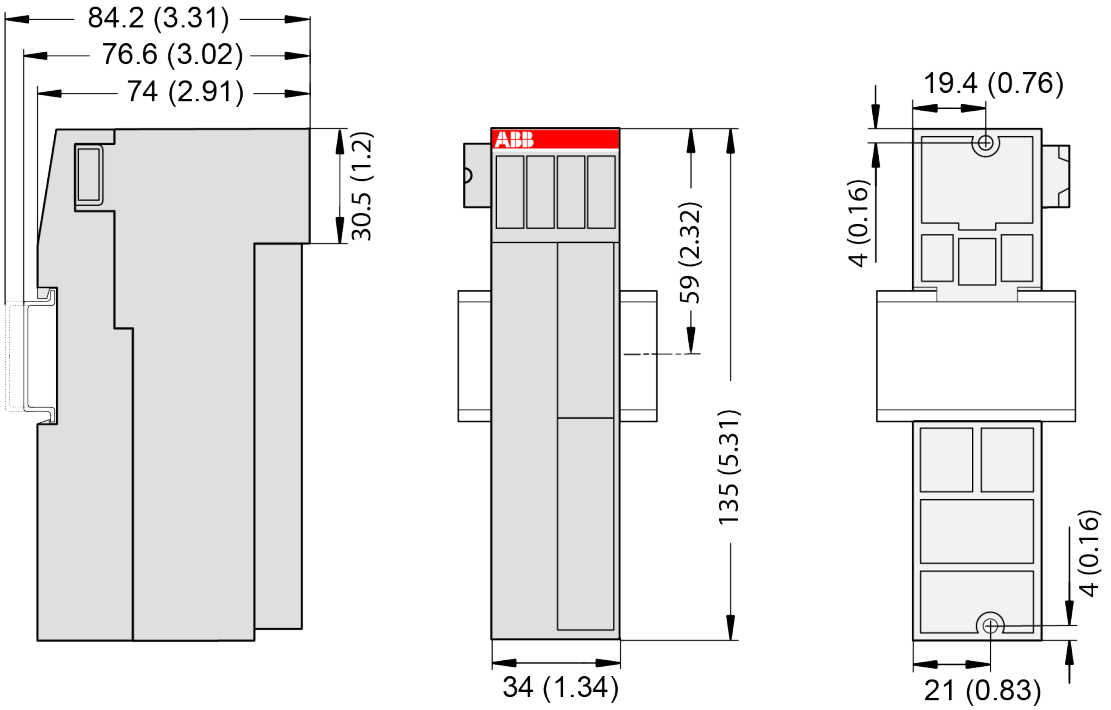
59.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

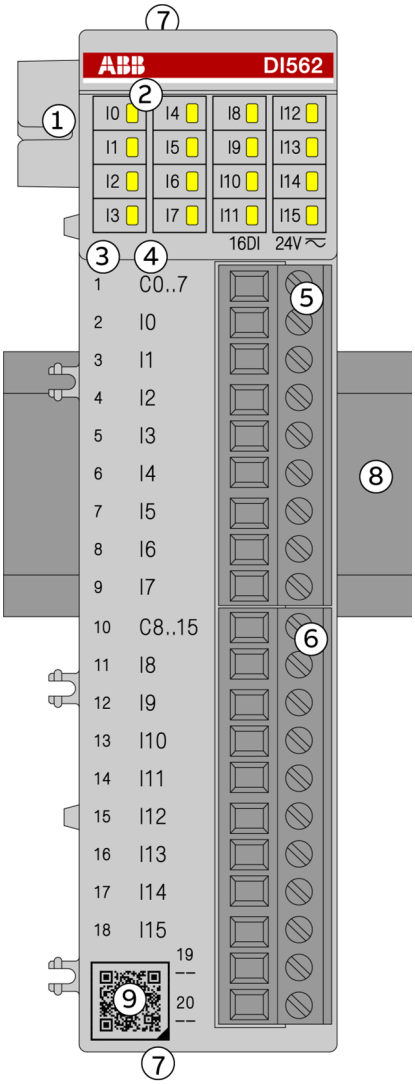
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

59.4 Dimensions



The dimensions are in mm and in brackets in inch.

59.5 Connections



1 I/O bus
2 16 yellow LEDs to display the signal states of the inputs I0 ... I15
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail
9 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

59.5.1 Inputs

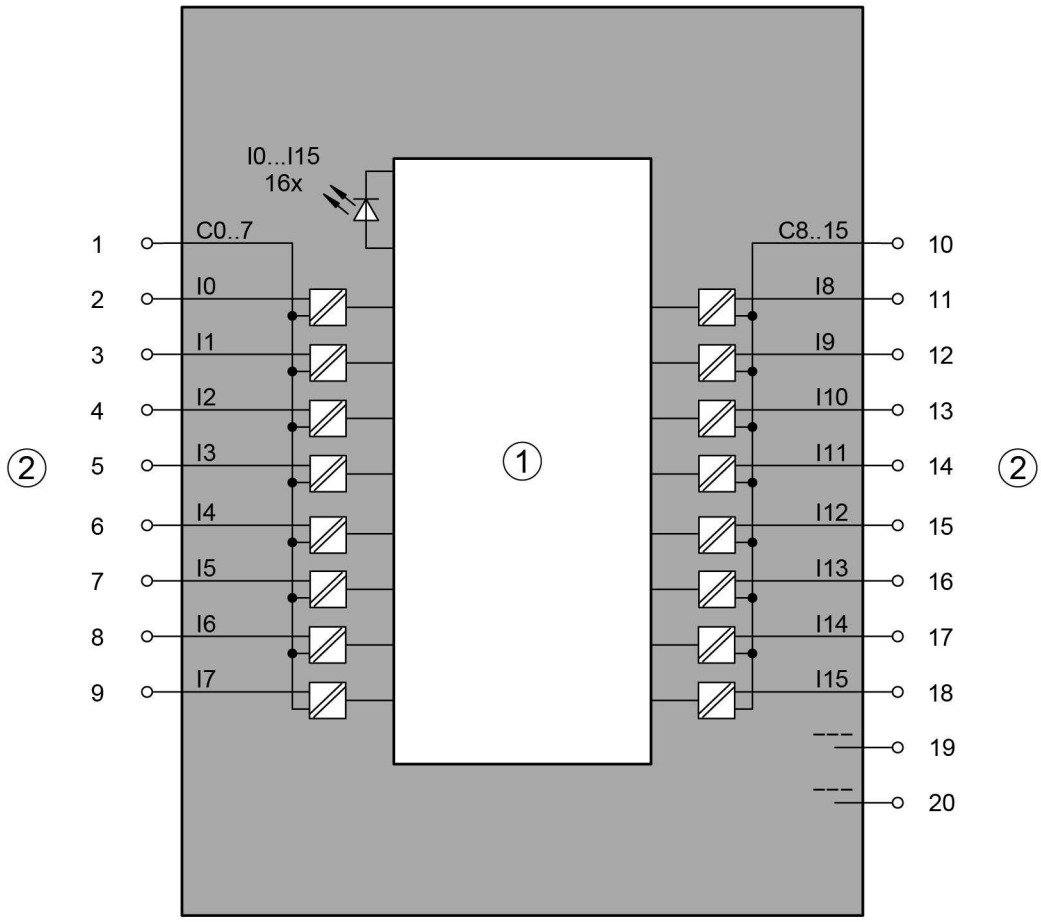


Fig. 89: Internal construction of the digital inputs

1 Logic - I/O bus interface
2 Digital inputs

Examples

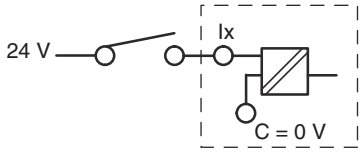


Fig. 90: DI562 used as source inputs

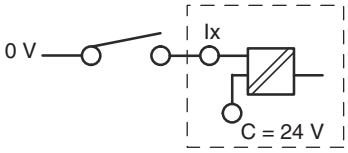


Fig. 91: DI562 used as sink inputs

60 DI571

- DI571



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

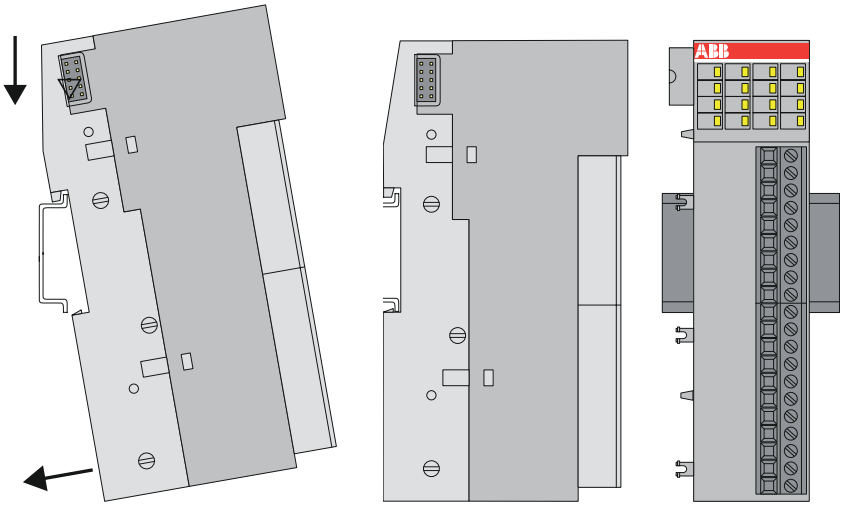
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

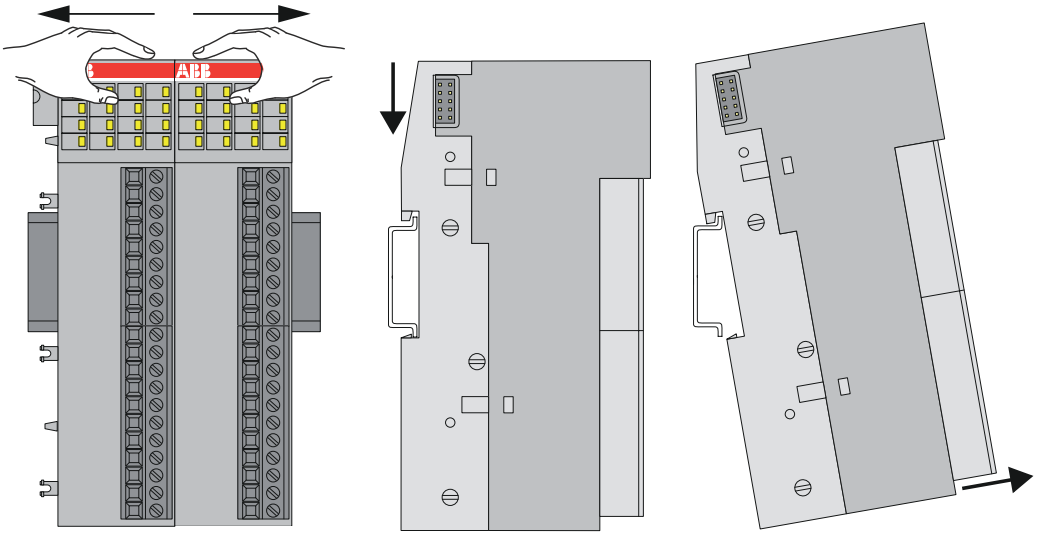
CAUTION!

Make sure that all channels are supplied from the same phase.

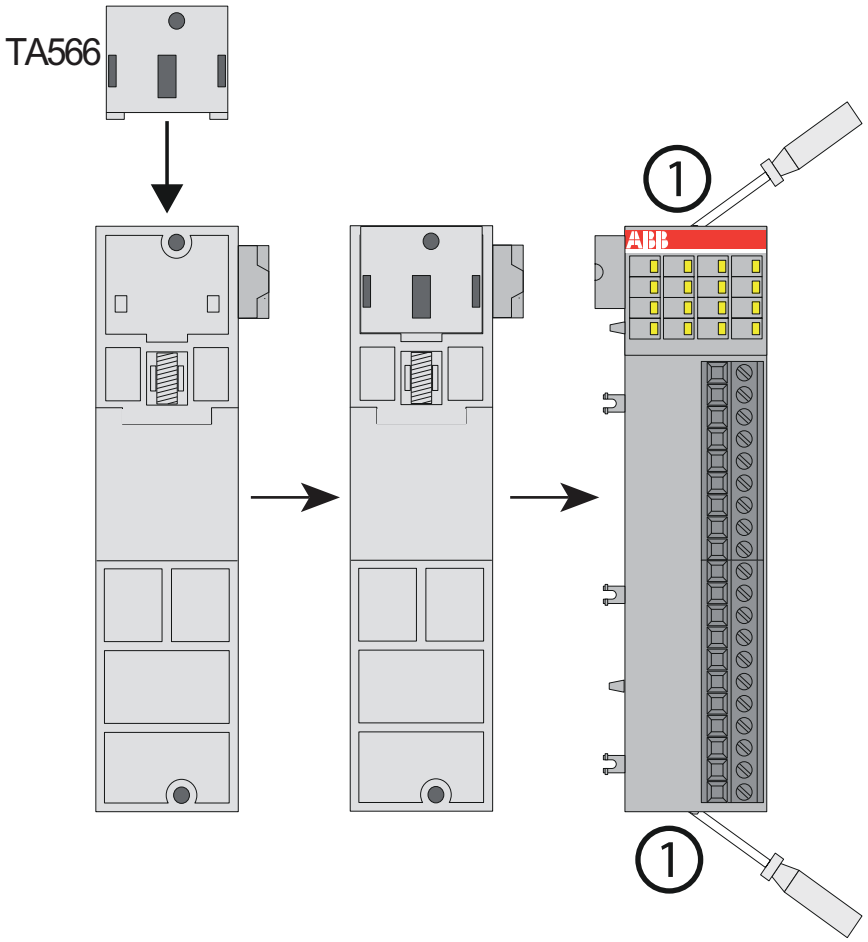
60.1 Assembly



60.2 Disassembly



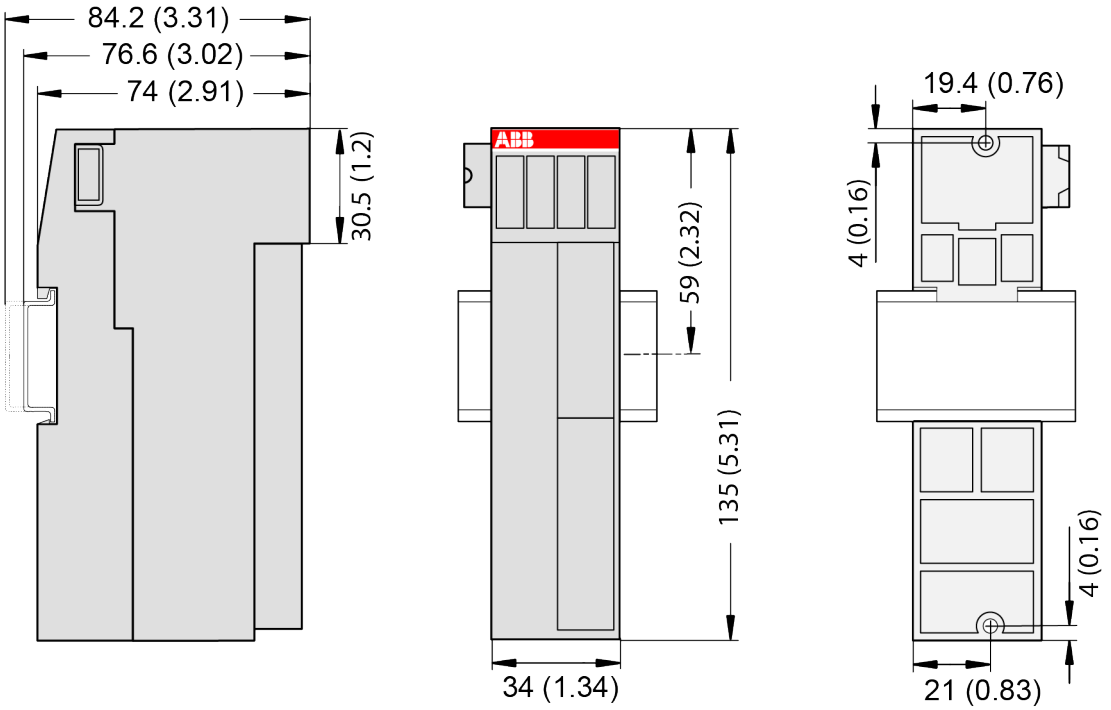
60.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

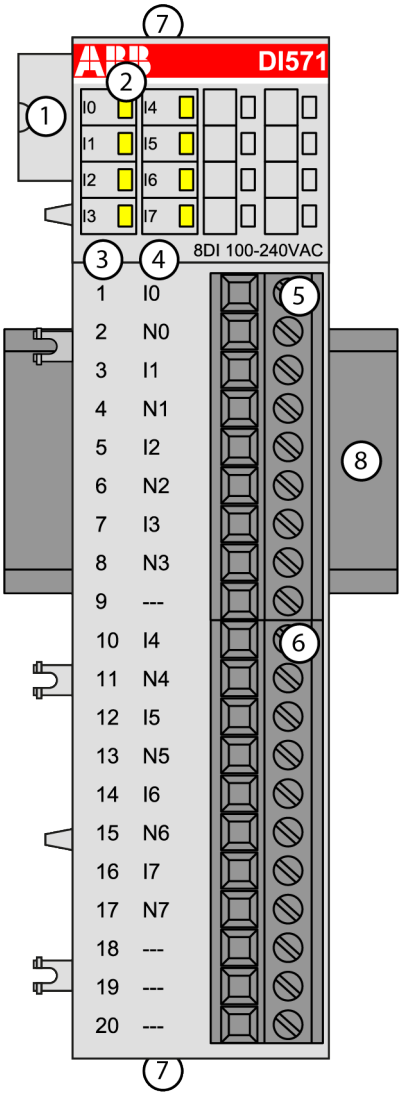
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

60.4 Dimensions



The dimensions are in mm and in brackets in inch.

60.5 Connections



1 I/O bus
2 8 yellow LEDs to display the signal states of the inputs I0 ... I7
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

60.5.1 Inputs/Outputs

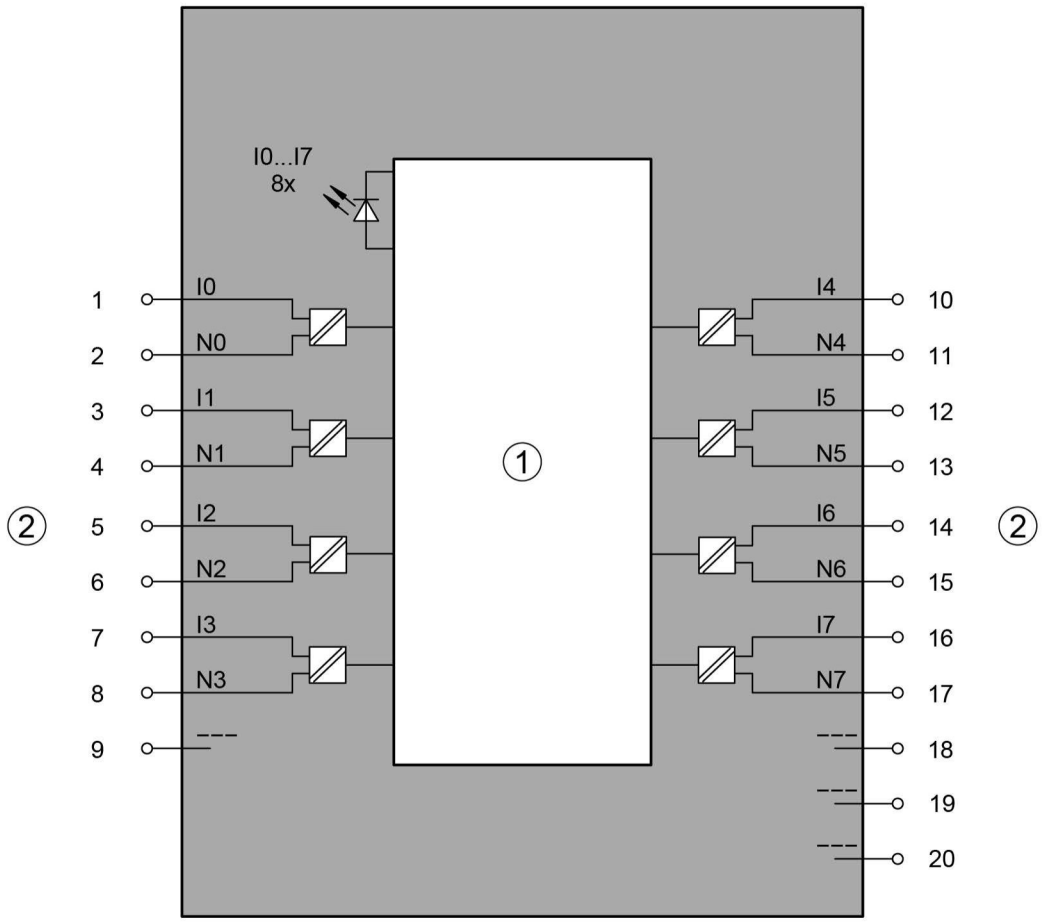


Fig. 92: Internal construction of the digital inputs

1 Logic - I/O bus interface
2 Digital inputs

Examples

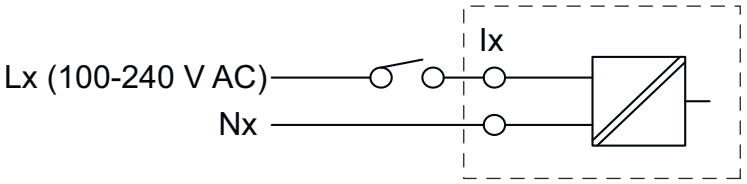


Fig. 93: Example for connection input Ix

61 DI572

- DI572



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

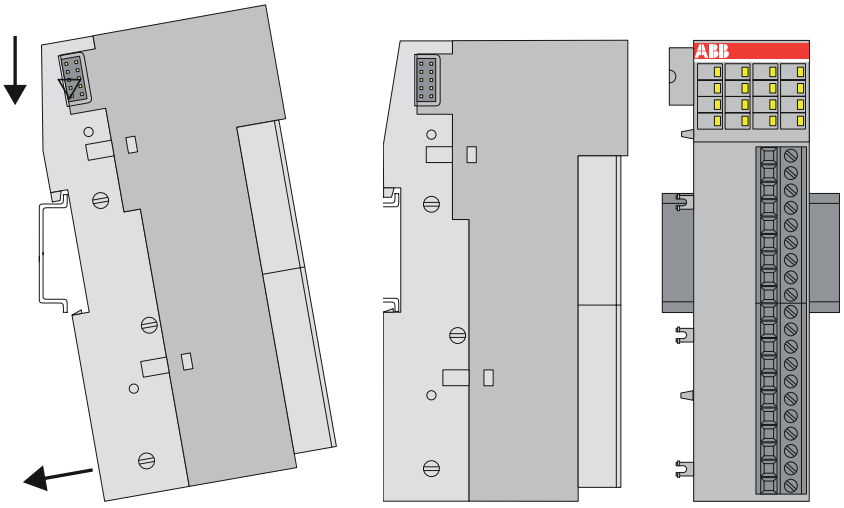
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

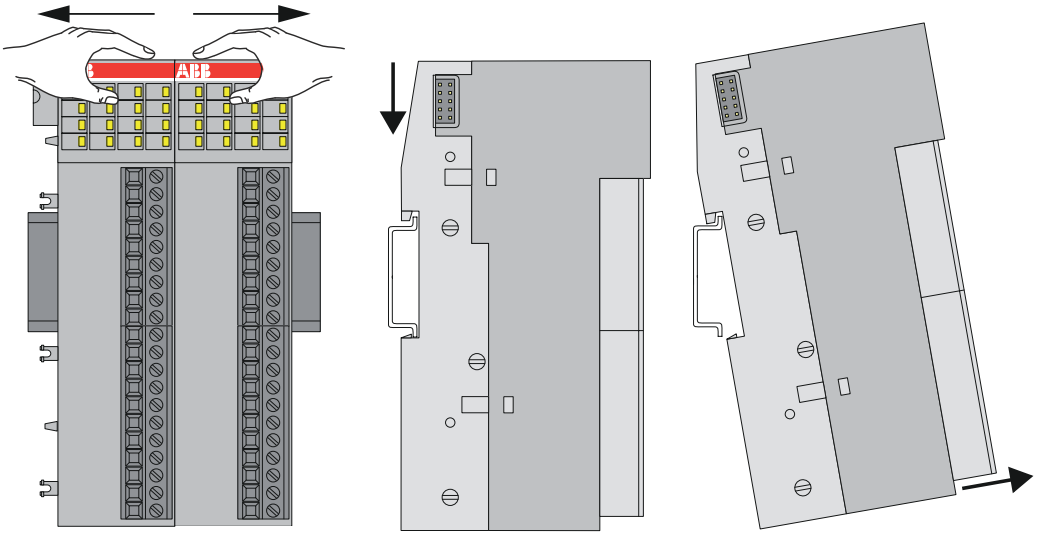
CAUTION!

Make sure that all channels are supplied from the same phase.

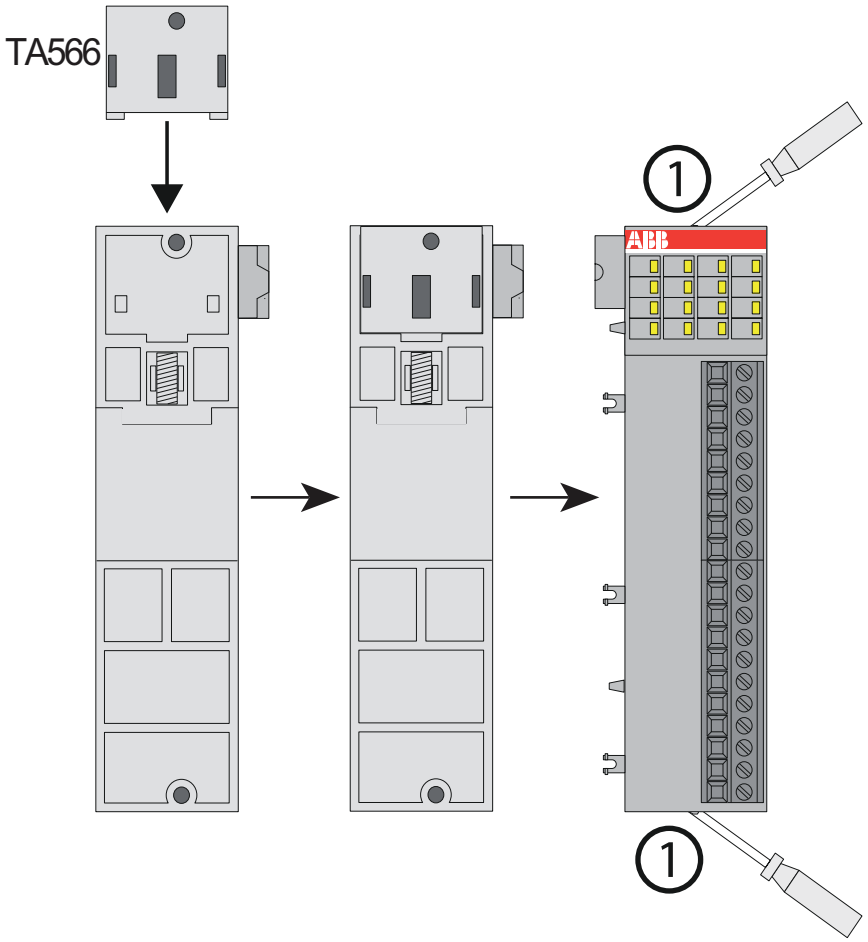
61.1 Assembly



61.2 Disassembly



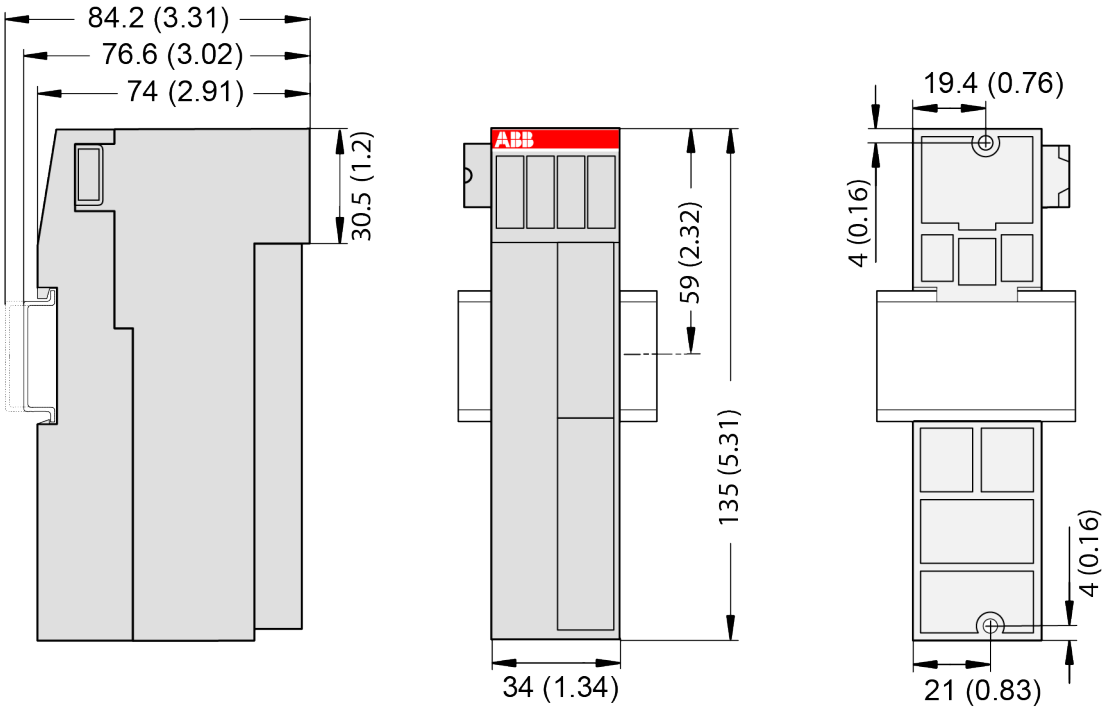
61.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

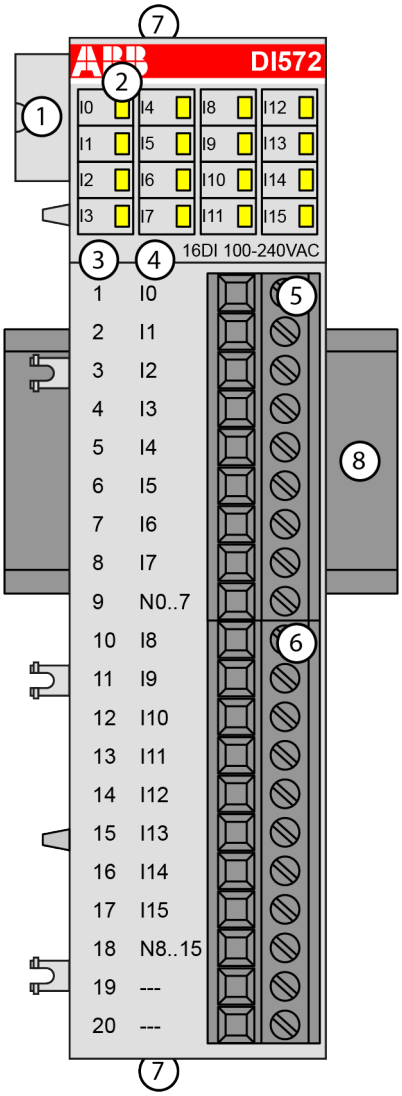
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

61.4 Dimensions



The dimensions are in mm and in brackets in inch.

61.5 Connections



1 I/O bus
2 16 yellow LEDs to display the signal states of the inputs I0 ... I15
3 Terminal number
4 Allocation of signal name
5 Terminal block for input signals (9-pin)
6 Terminal block for input signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

> *All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.*

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

61.5.1 Inputs/Outputs

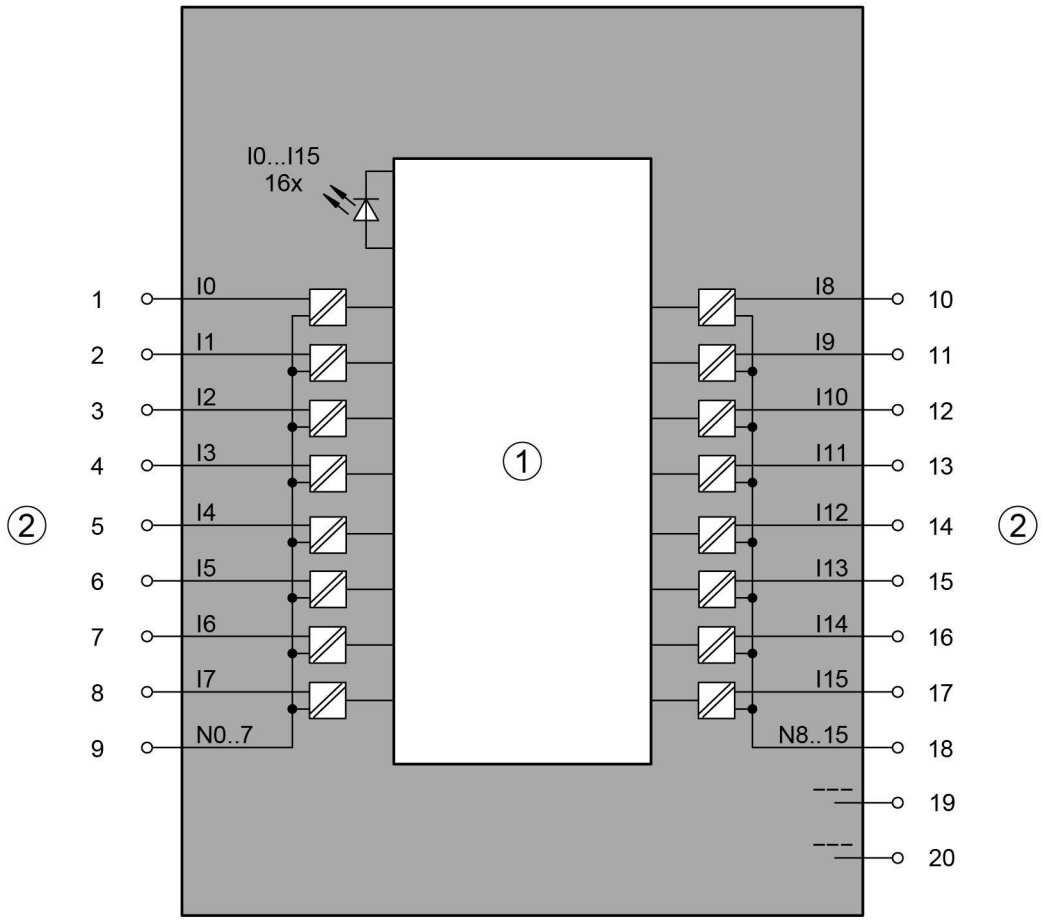


Fig. 94: Block diagram for the internal construction of the digital inputs.

1 Logic - I/O bus interface
2 Digital inputs

Examples

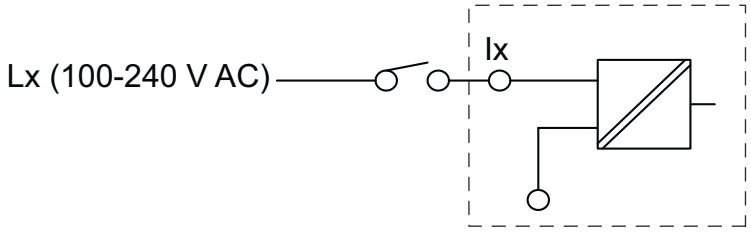
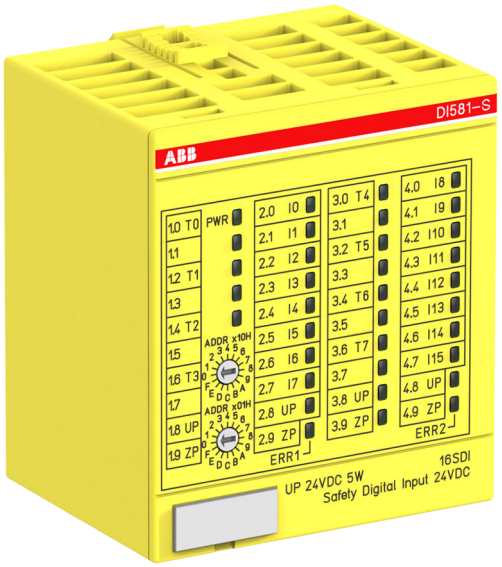


Fig. 95: Example for connection input Ix

62 DI581-S(-XC)

- DI581-S
- DI581-S-XC



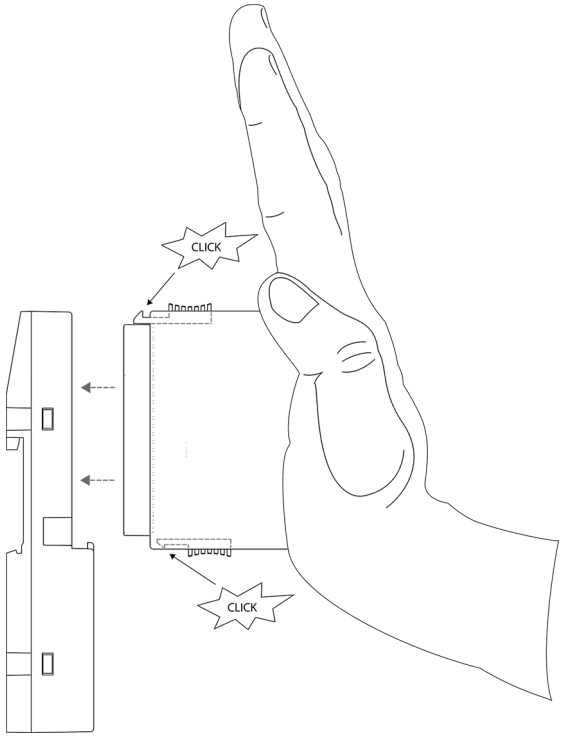
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

62.1 Assembly

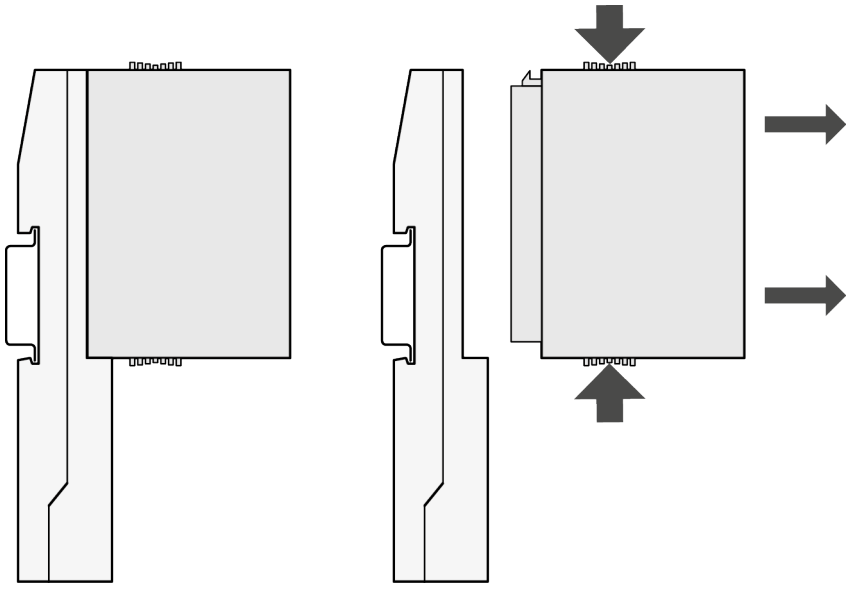


1. Put the module on the terminal unit

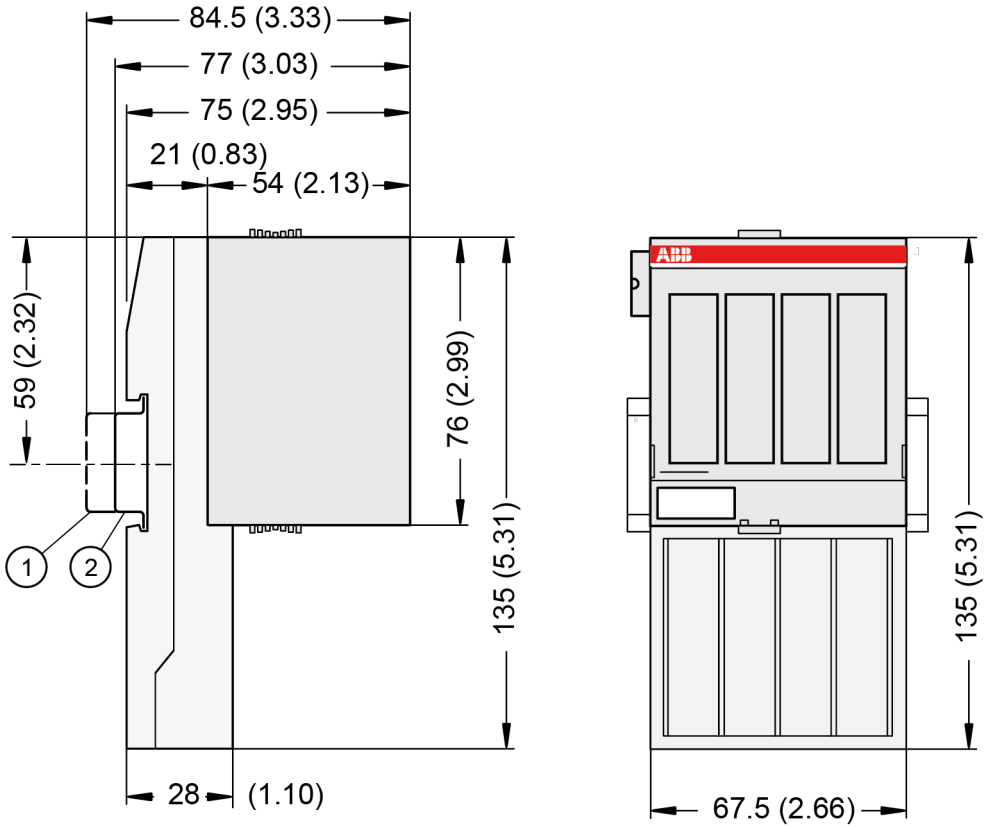
   ⇨ Module clicks in.

2. Then press the module with a force of at least 100 N into the terminal unit to achieve proper electrical contact.

62.2 Disassembly



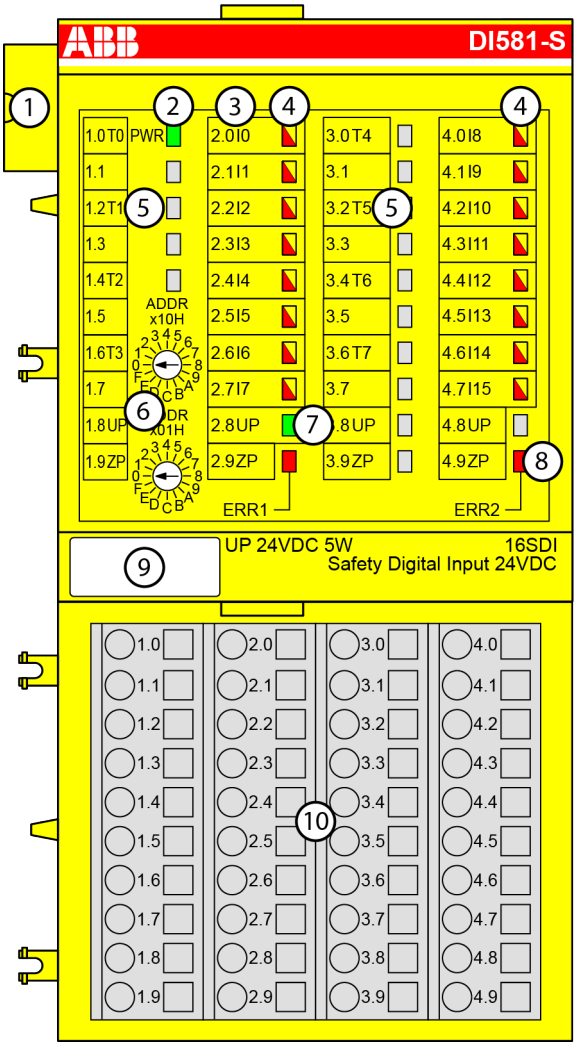
62.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

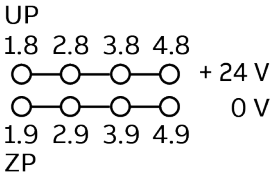
The dimensions are in mm and in brackets in inch.

62.4 Connections



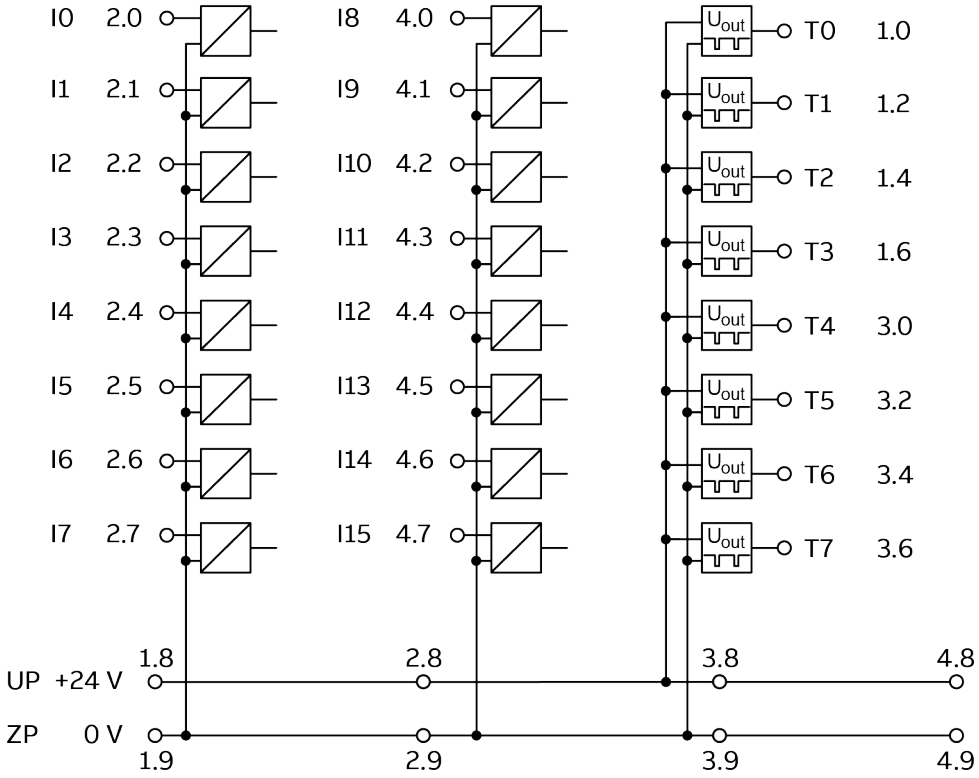
1 I/O bus
2 System LED
3 Allocation of terminal number and signal name
4 16 yellow/red LEDs to display the signal states of the digital inputs I0 to I15
5 8 Test pulse outputs T0 to T7
6 2 rotary switches for setting the PROFIsafe address
7 1 green LED to display the state of the process supply voltage UP
8 2 red LEDs to display errors
9 Label
10 Terminal unit TU582-S(-XC)
❄ Sign for XC version

62.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

62.4.2 Inputs



Example

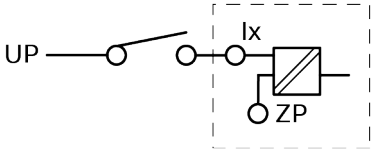


Fig. 96: Example of connection input Ix

AC500-S safety user manual
For a detailed description of the connection of the module, please refer to the "AC500-S safety user manual".

63 DO524(-XC)

- DO524
- DO524-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

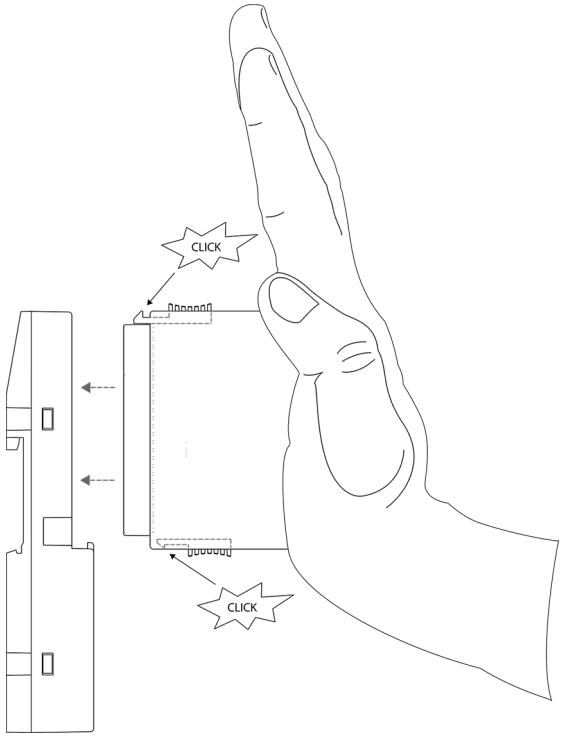
NOTICE!

Hot swap

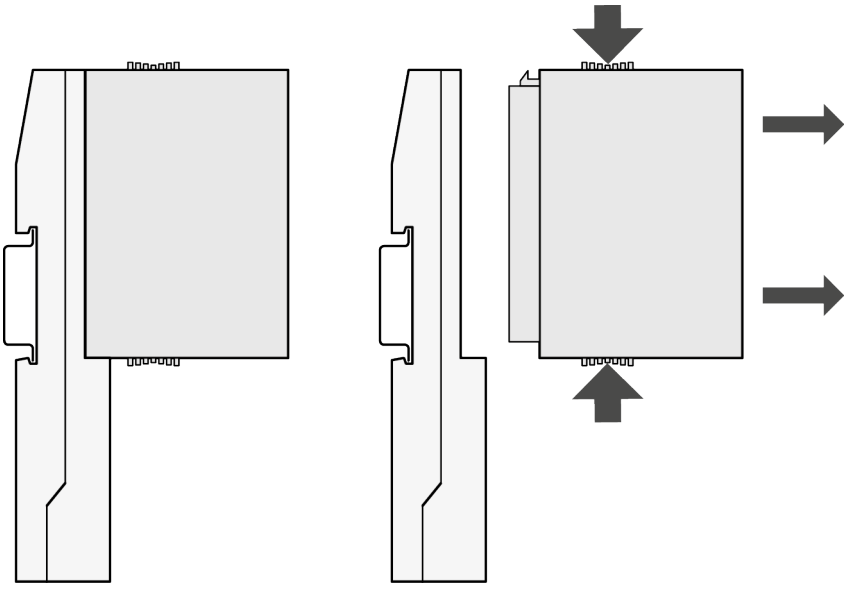
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

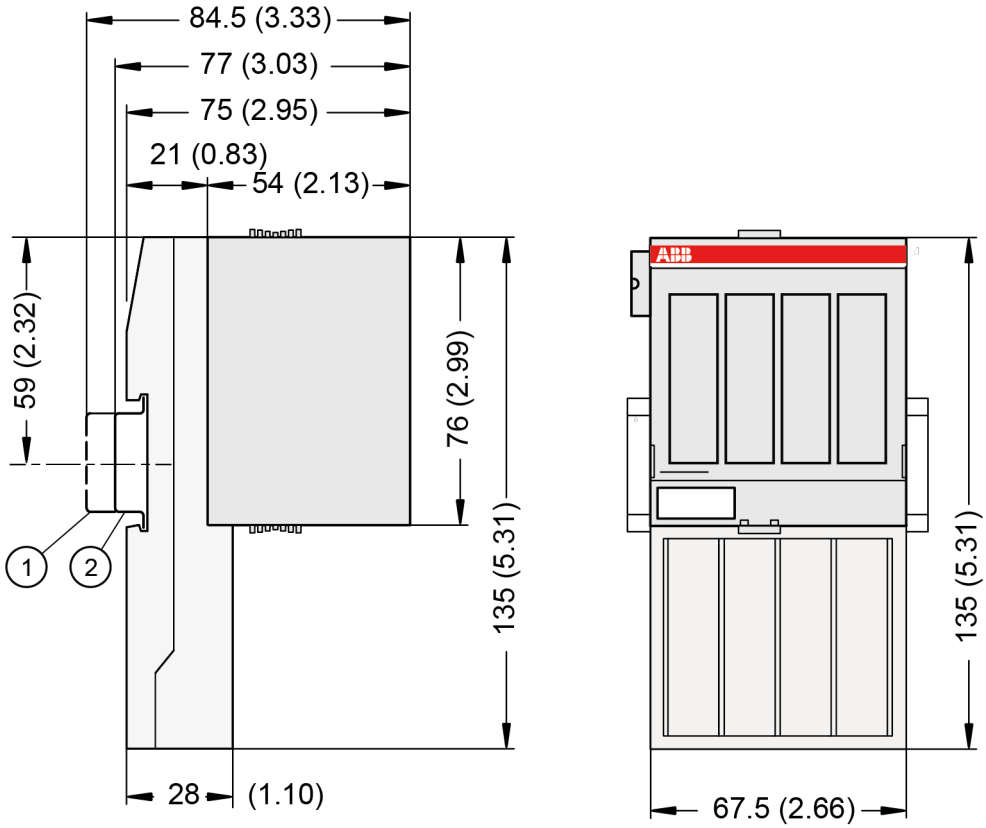
63.1 Assembly



63.2 Disassembly



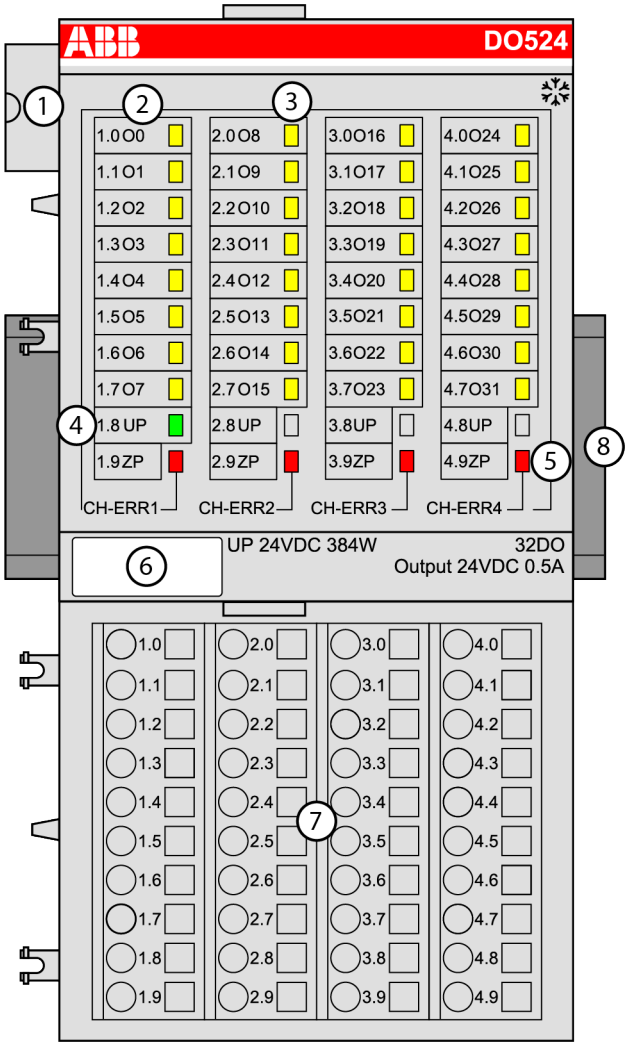
63.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

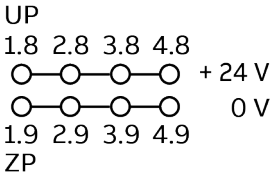
63.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 32 yellow LEDs to display the signal states at the digital outputs (O0 ... O31)
4 1 green LED to display the state of the process supply voltage UP
5 4 red LEDs to display errors
6 Label
7 Terminal unit
8 DIN rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

63.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

63.4.2 Outputs

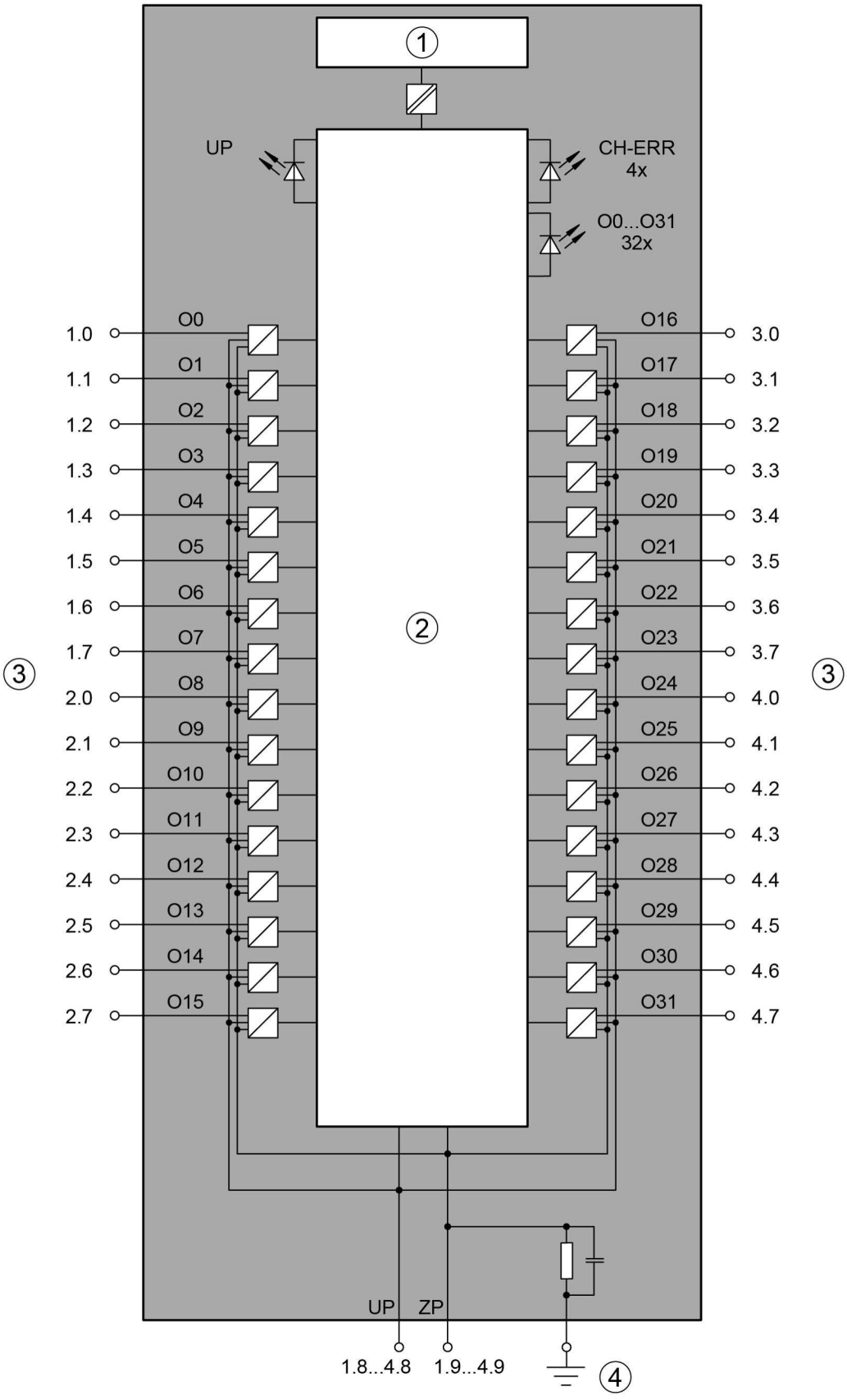


Fig. 97: Internal construction of the digital outputs

1 I/O bus interface
2 Logic
3 Digital outputs
4 Functional earth connection

Example

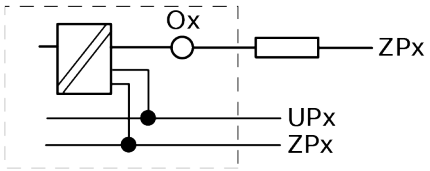


Fig. 98: Example of connection output

64 DO526(-XC)

- DO526
- DO526-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

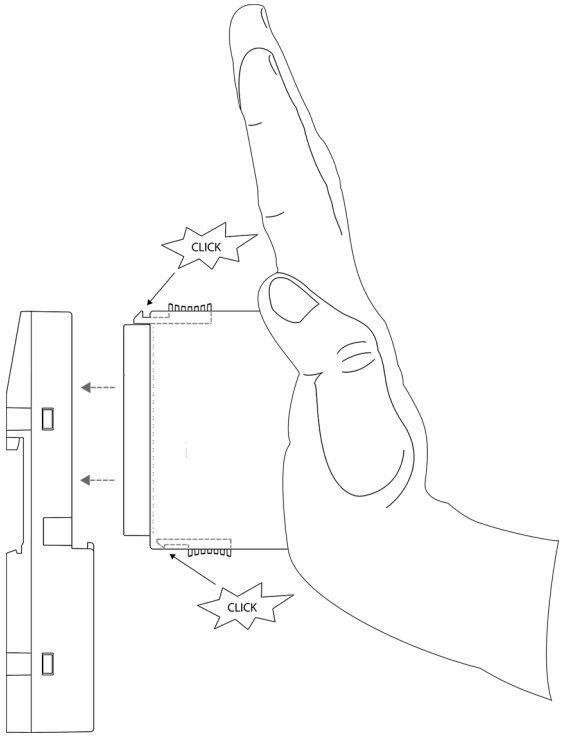
NOTICE!

Hot swap

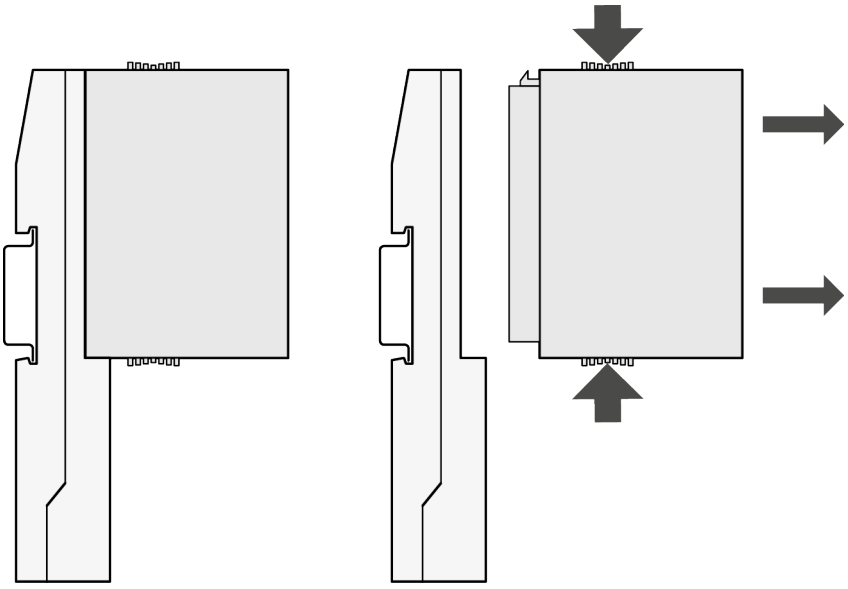
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

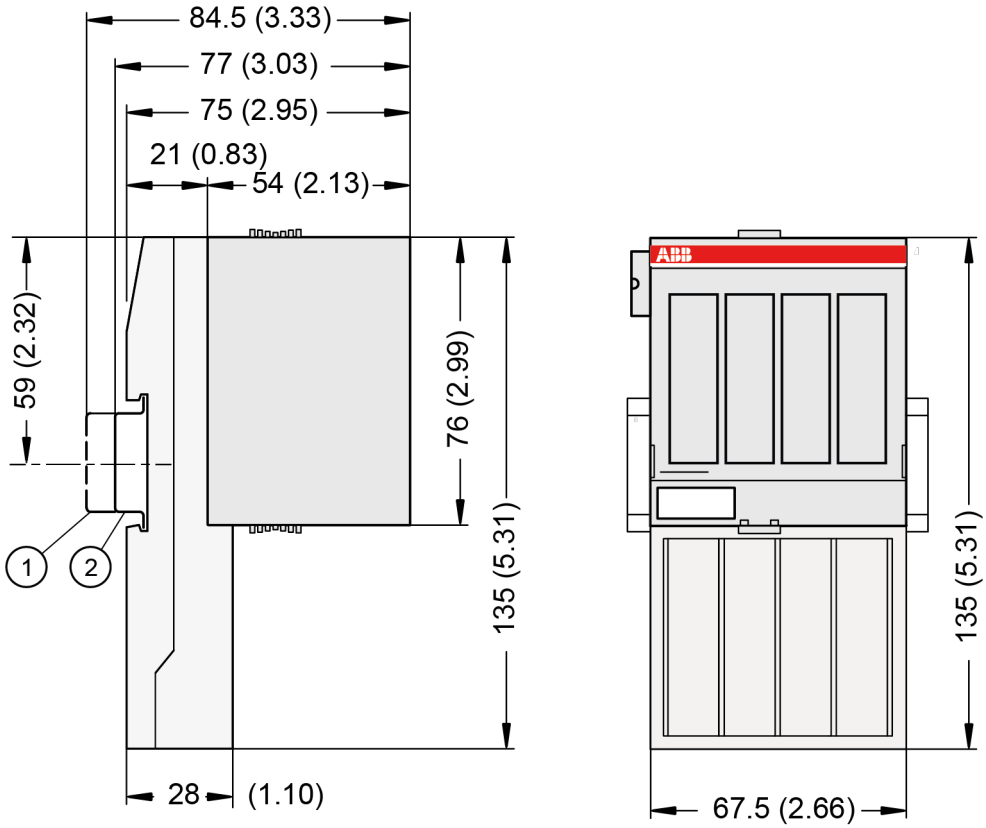
64.1 Assembly



64.2 Disassembly



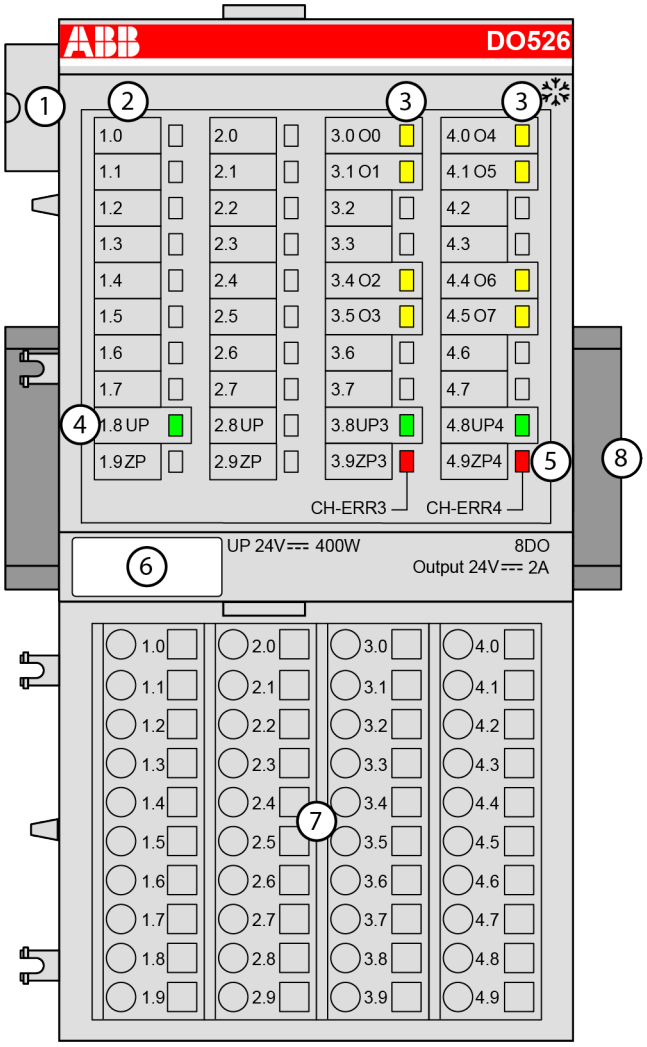
64.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

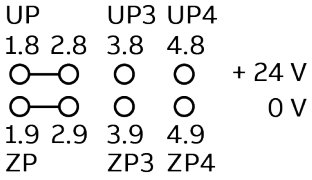
64.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states of the outputs O0 ... O7
4 3 green LEDs to display the states of the process supply voltage UP, UP3 and UP4
5 2 red LEDs to display errors
6 Label
7 Terminal unit
8 DIN-rail
❄ Sign for XC version

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

64.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

64.4.2 Outputs

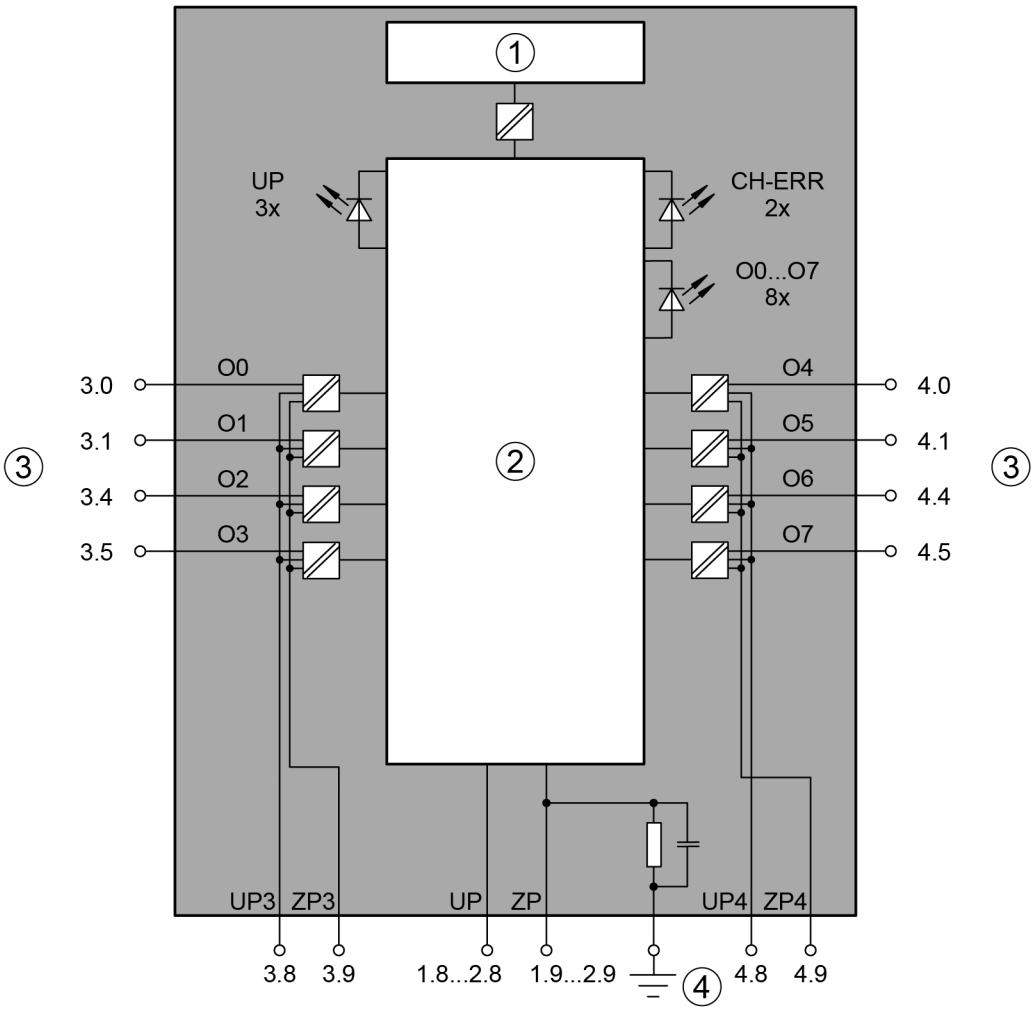


Fig. 99: Internal construction of the digital outputs

1 I/O bus
2 Logic
3 Digital outputs
4 Functional earth connection

Example

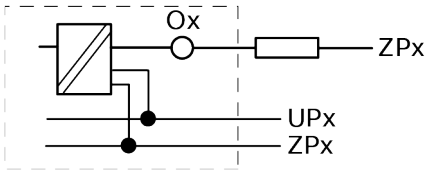
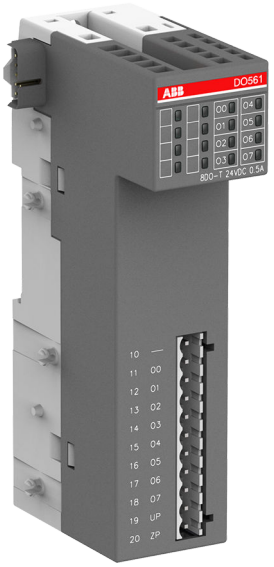


Fig. 100: Example of connection output

65 DO561

- DO561



CAUTION!

Risk of injury and damaging the product!

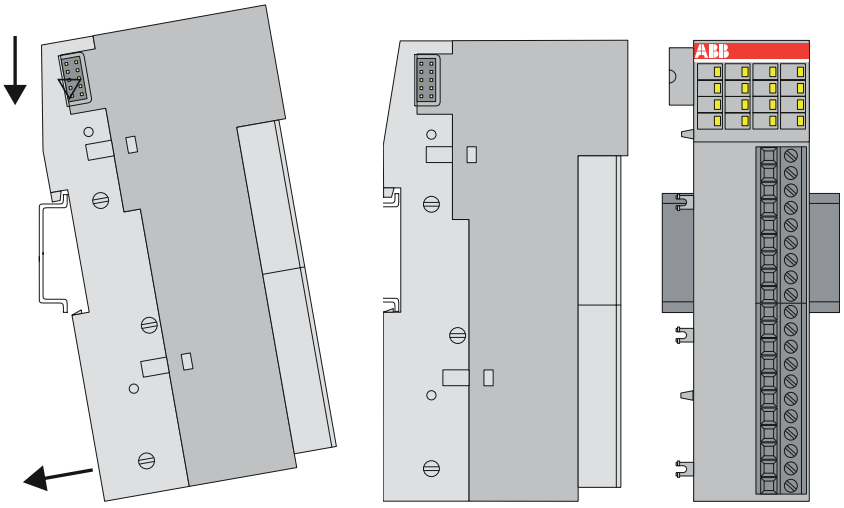
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

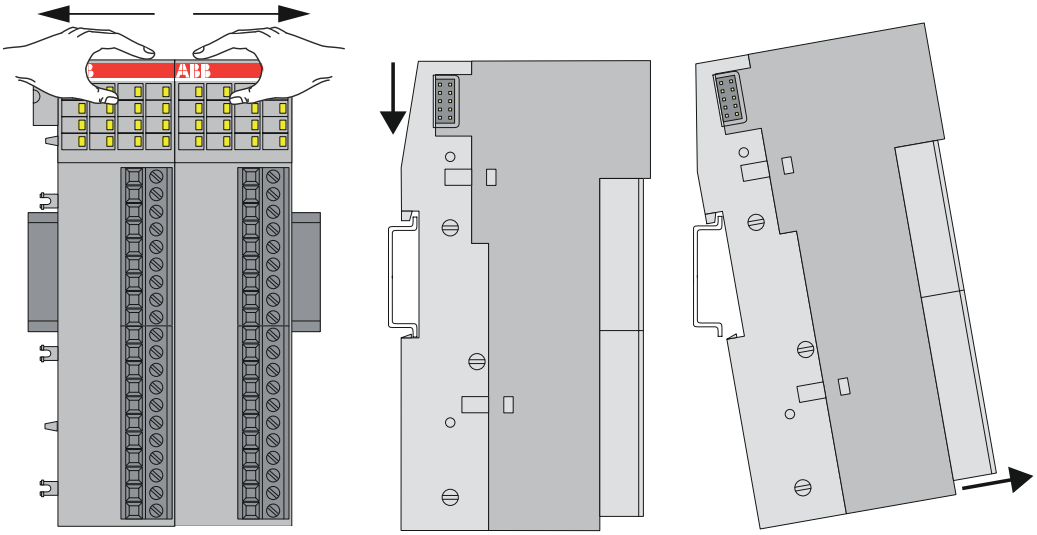
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

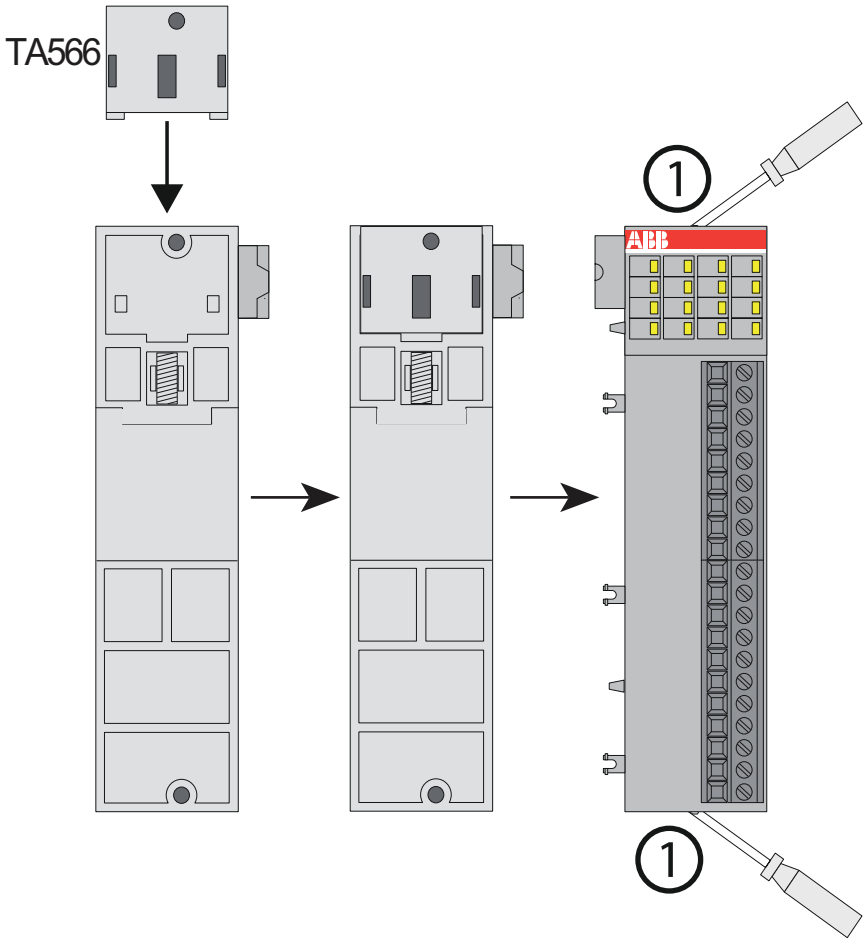
65.1 Assembly



65.2 Disassembly



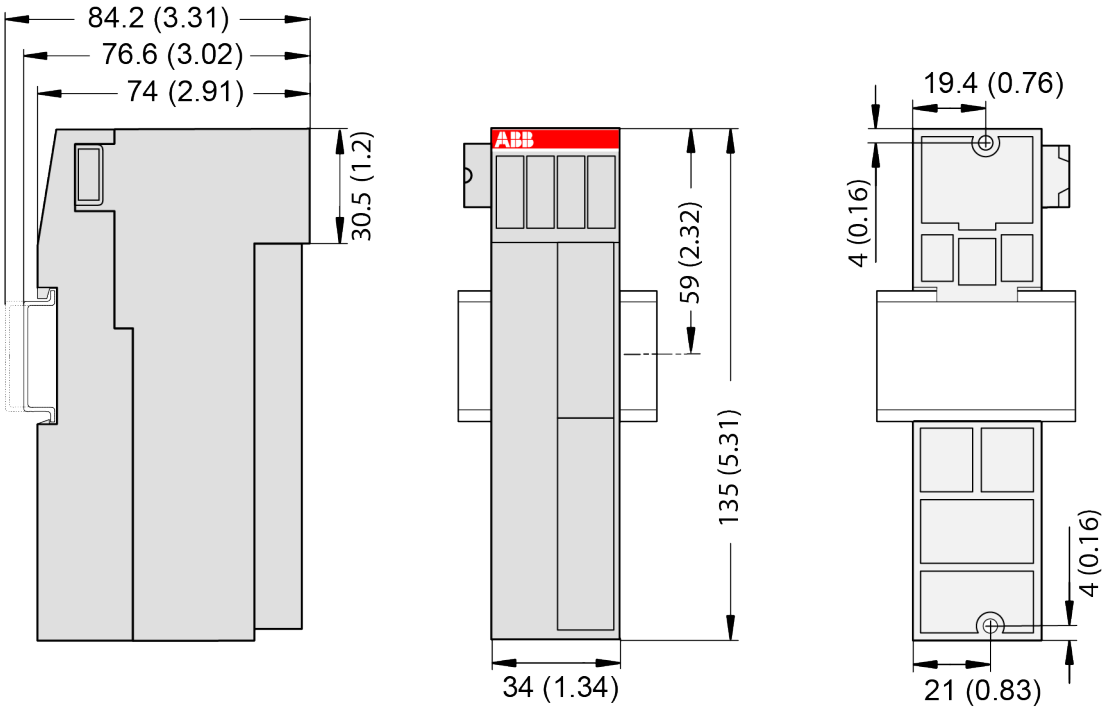
65.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

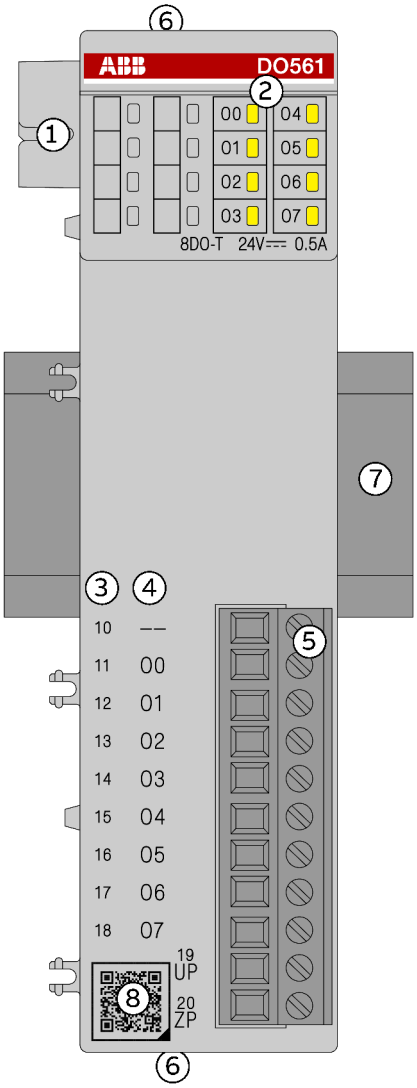
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

65.4 Dimensions



The dimensions are in mm and in brackets in inch.

65.5 Connections



1 I/O bus
2 8 yellow LEDs to display the signal states of the outputs O0 ... O7
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (11-pin)
6 2 holes for wall-mounting with screws
7 DIN rail
8 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

65.5.1 Outputs

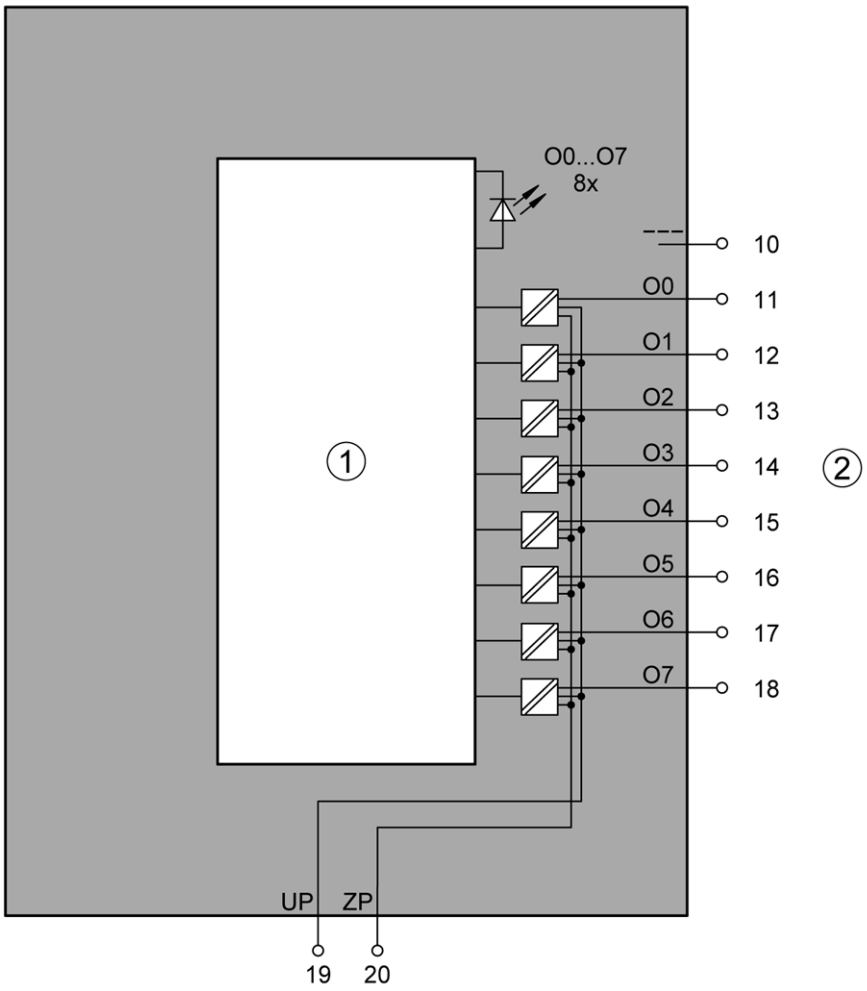


Fig. 101: Internal construction of the digital outputs

1 Logic - I/O interface
2 Digital outputs
3 Functional earth connection

Examples

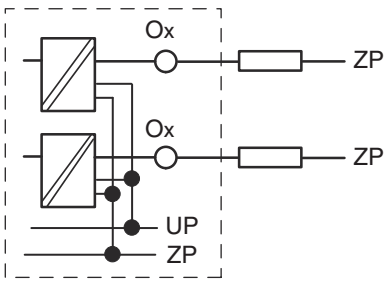


Fig. 102: Example of connection output Ox

66 DO562

- DO562



CAUTION!

Risk of injury and damaging the product!

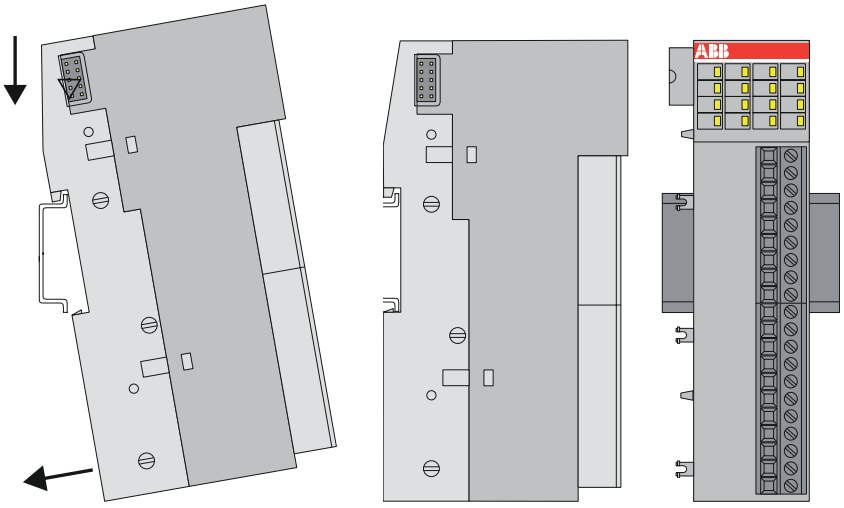
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

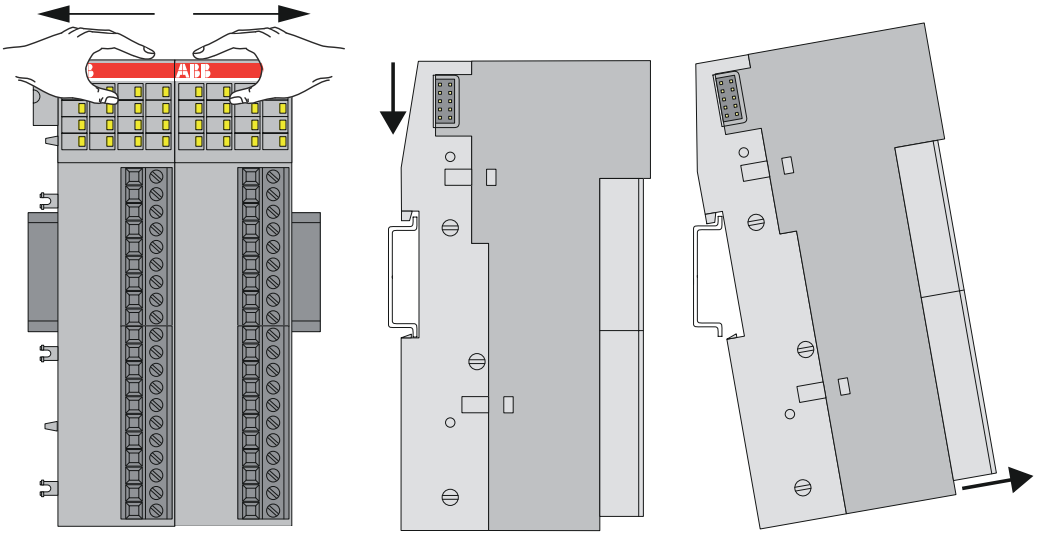
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

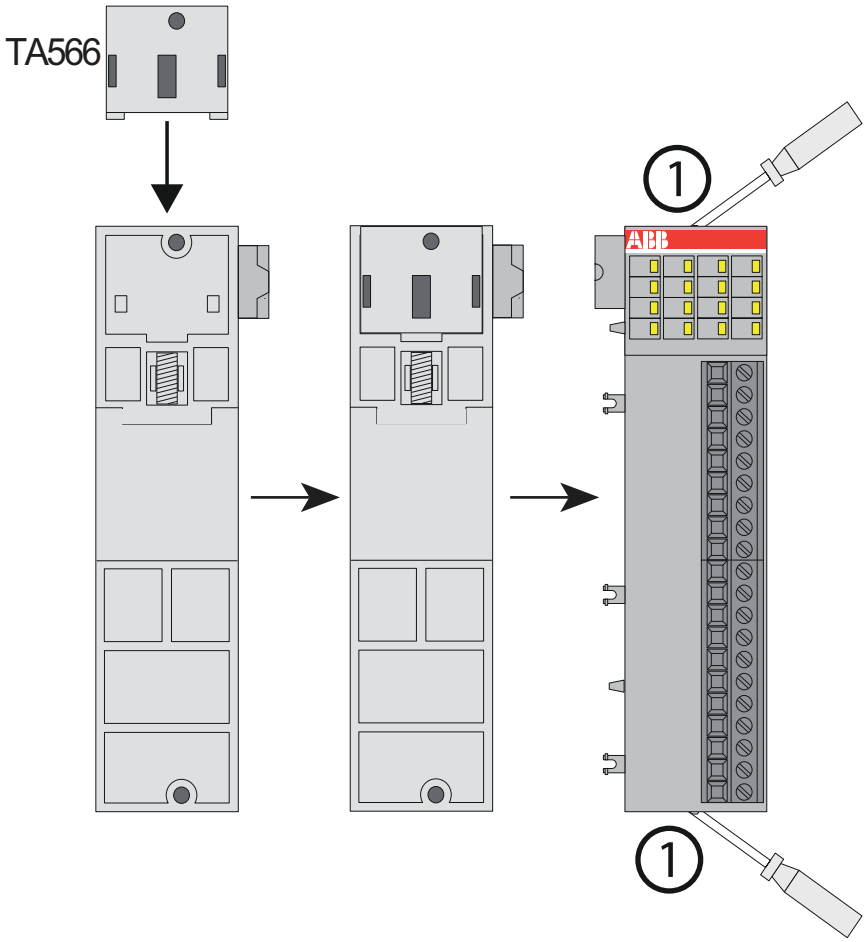
66.1 Assembly



66.2 Disassembly



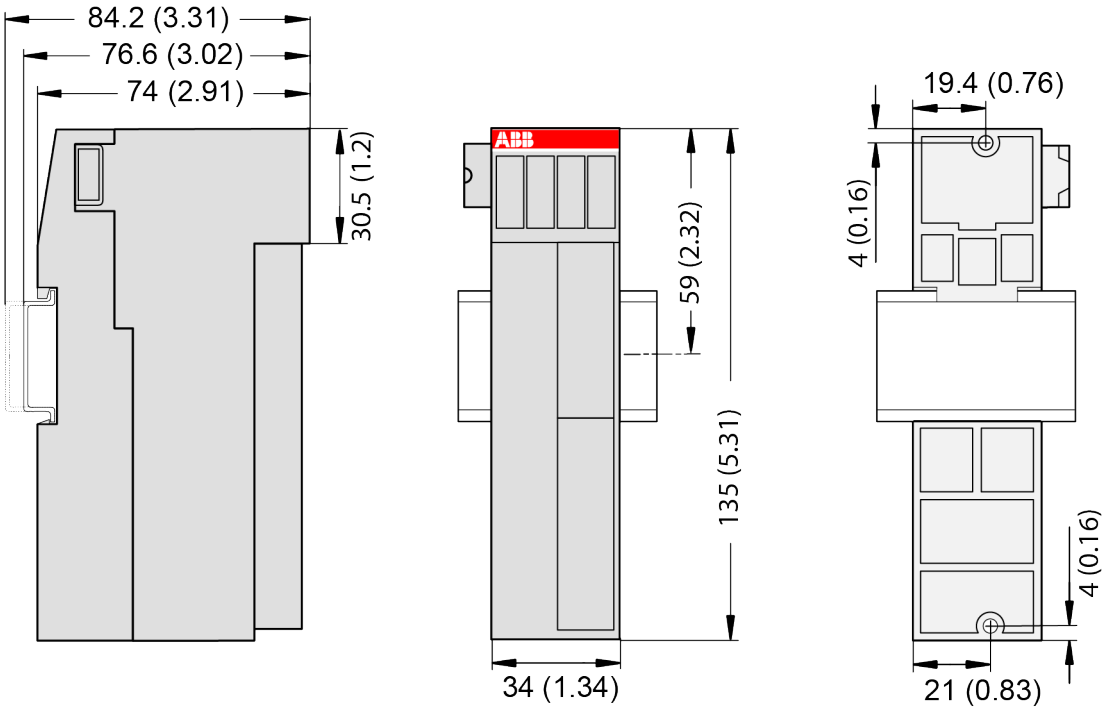
66.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

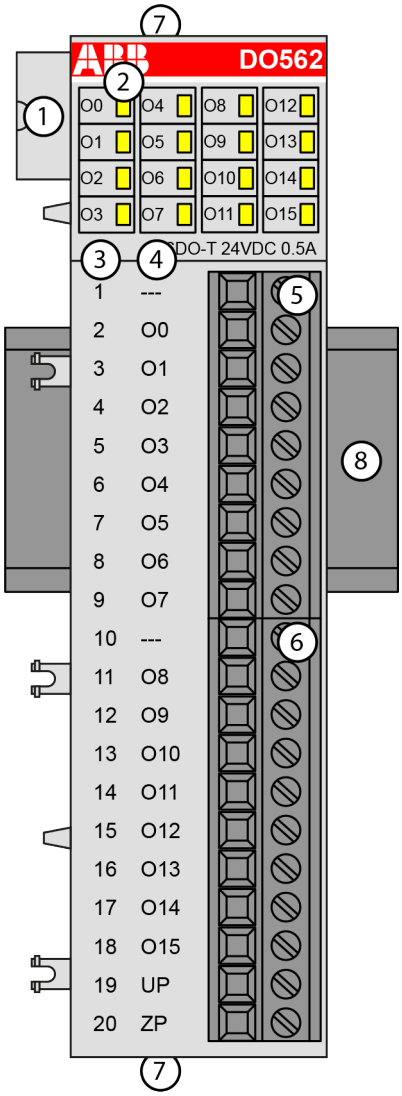
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

66.4 Dimensions



The dimensions are in mm and in brackets in inch.

66.5 Connections



1 I/O bus
2 16 yellow LEDs to display the signal states of the outputs O0 ... O15
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (9-pin)
6 Terminal block for output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

66.5.1 Outputs

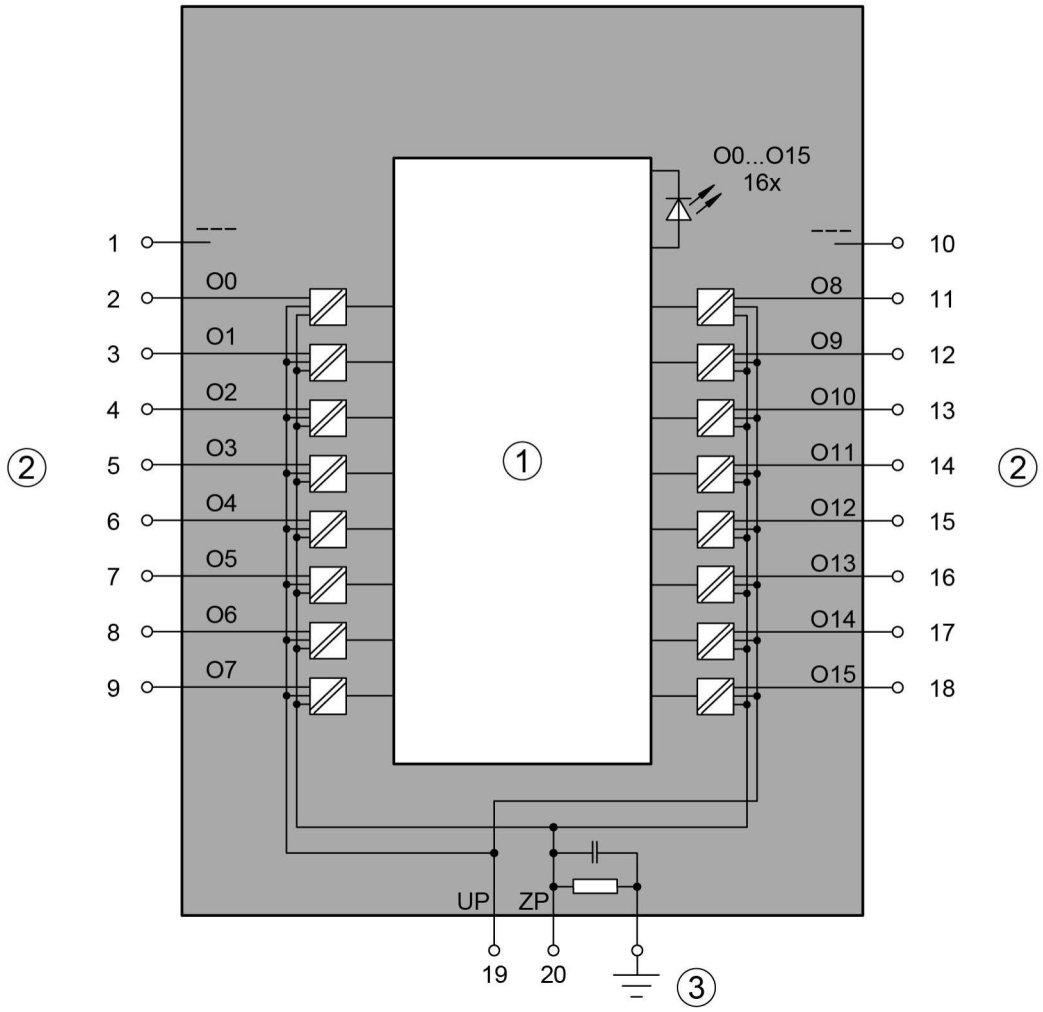


Fig. 103: Internal construction of the digital outputs

1 Logic - I/O interface
2 Digital outputs
3 Functional earth connection

Examples

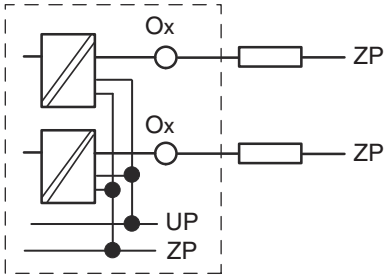


Fig. 104: Example for connection output Ox

67 DO571

- DO571



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

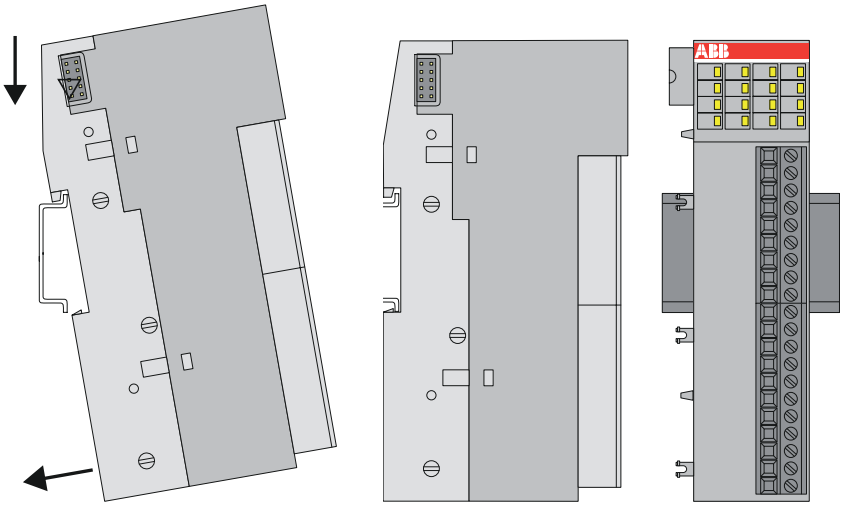
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

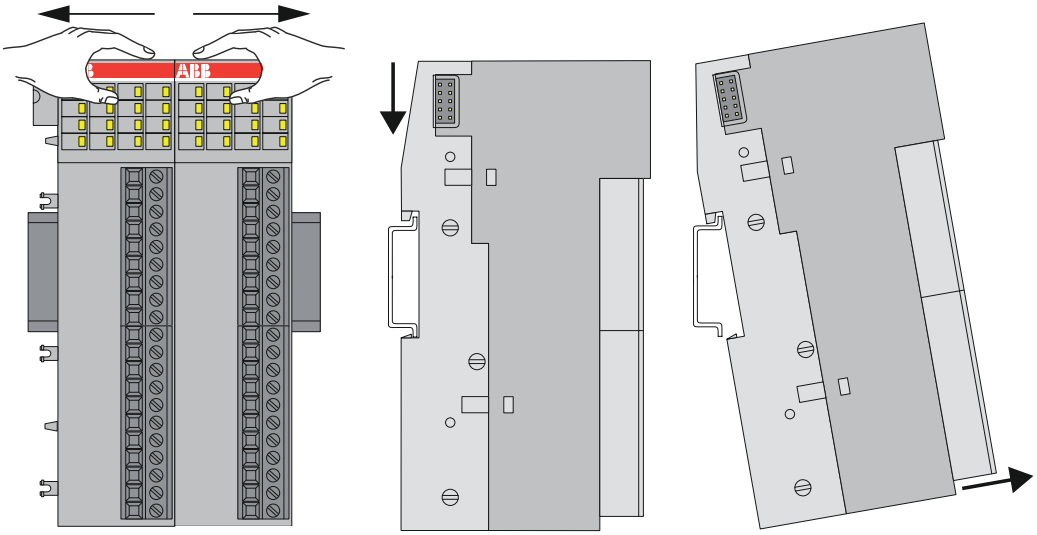
CAUTION!

Make sure that all channels are supplied from the same phase.

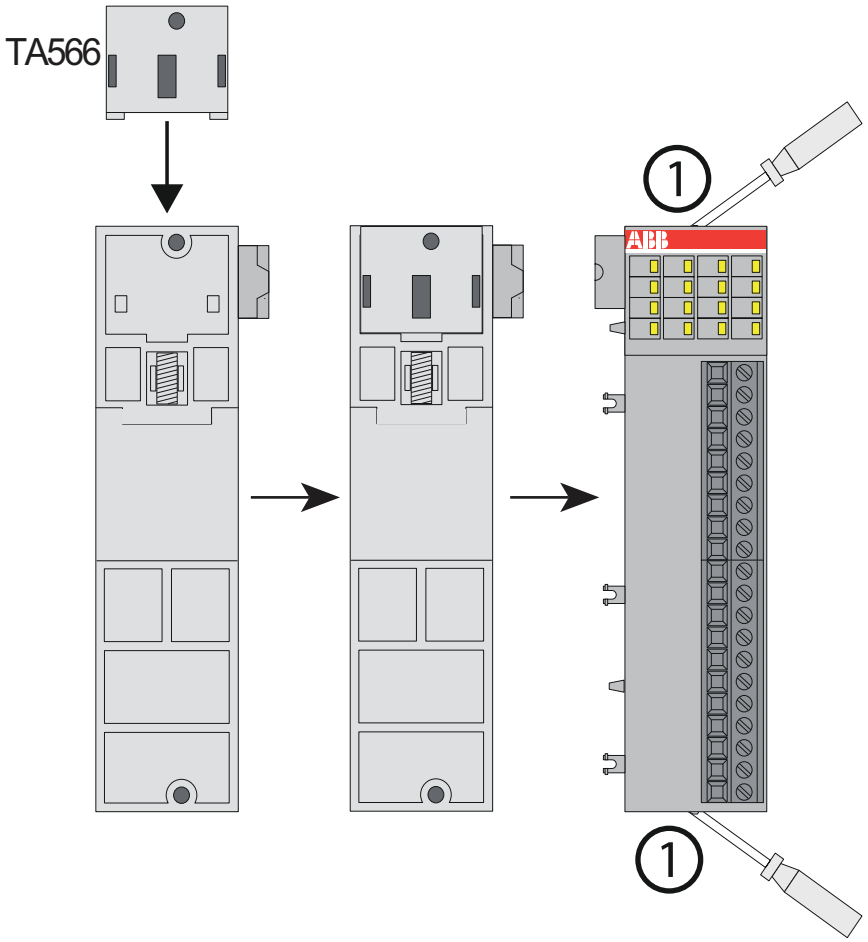
67.1 Assembly



67.2 Disassembly



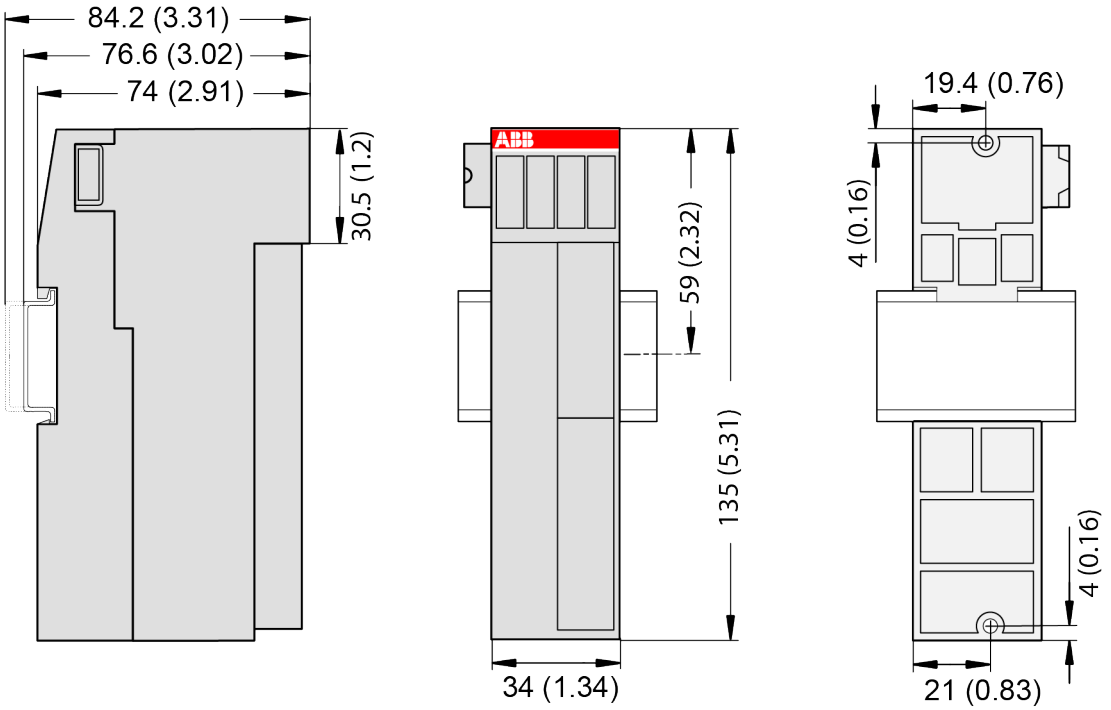
67.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

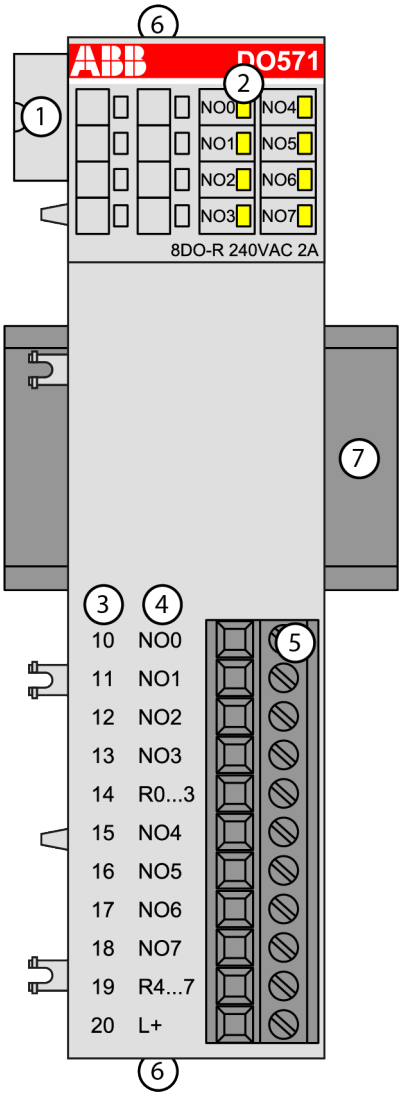
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

67.4 Dimensions



The dimensions are in mm and in brackets in inch.

67.5 Connections

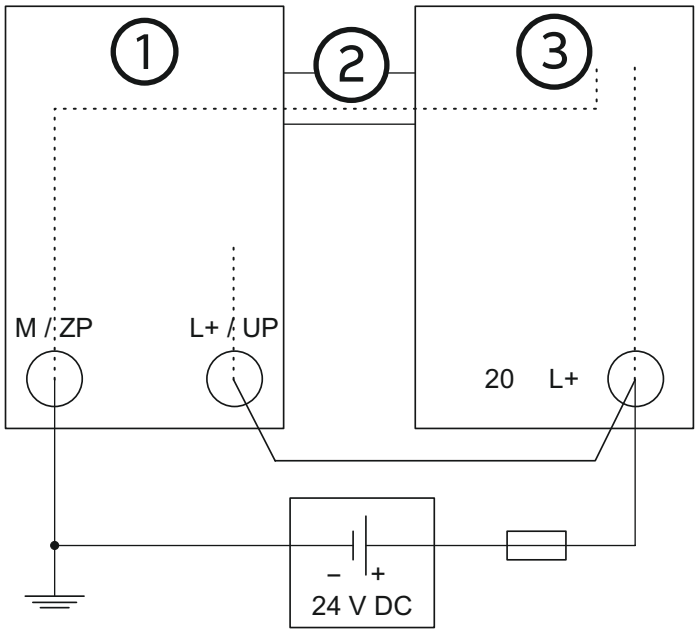


1 I/O bus
2 8 yellow LEDs to display the signal states of the outputs O0 ... O7
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (11-pin)
6 2 holes for wall-mounting with screws
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front



1 CPU or communication interface module
2 I/O bus
3 DO571

67.5.1 Inputs/Outputs

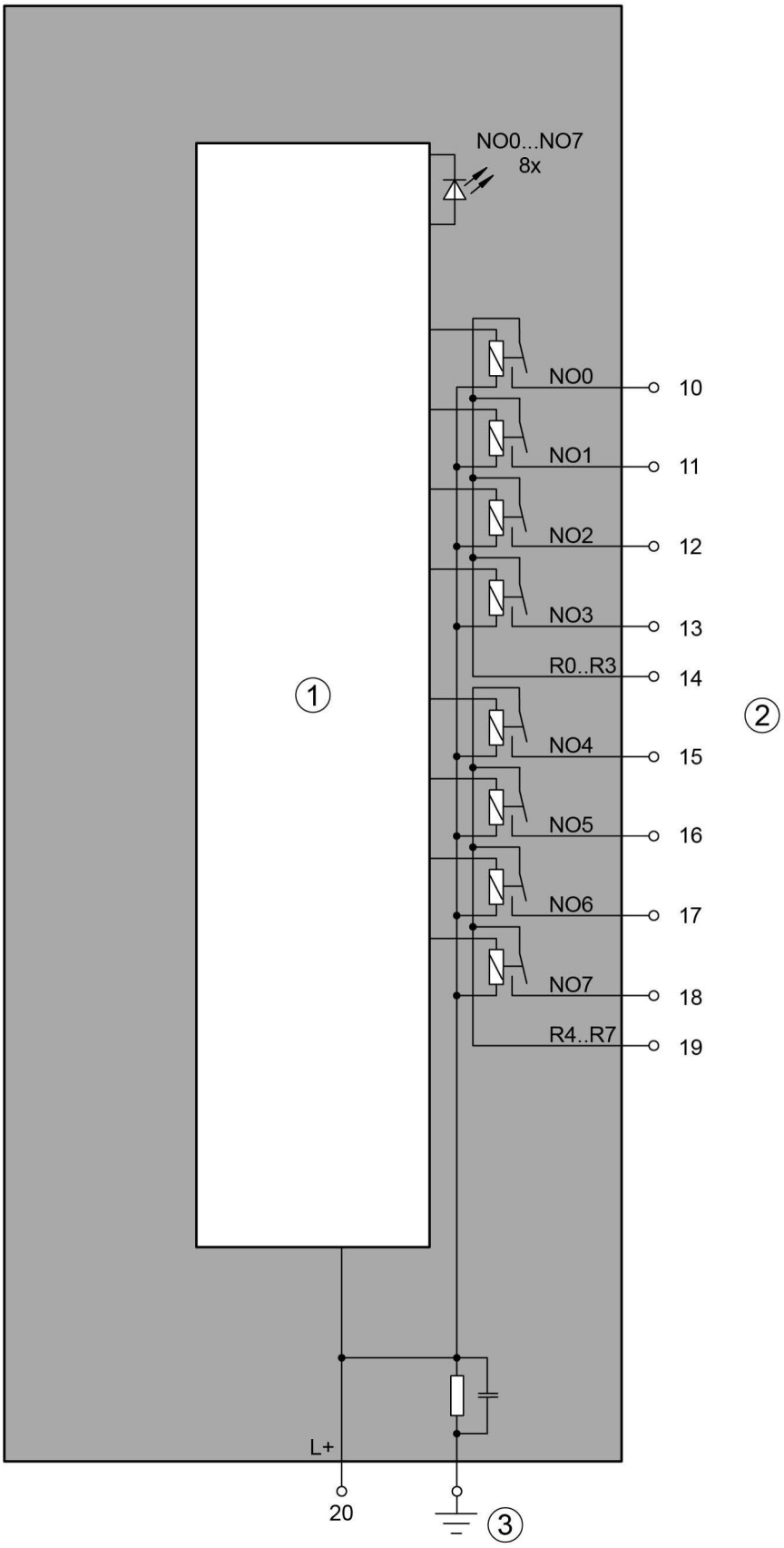


Fig. 105: Internal construction of the digital outputs

1 Logic - I/O interface
2 Digital outputs
3 Functional earth connection

Examples

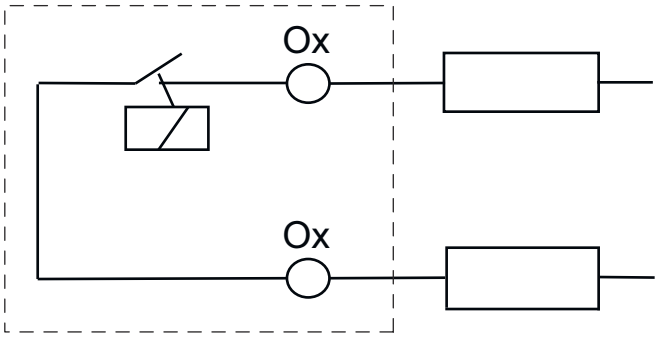
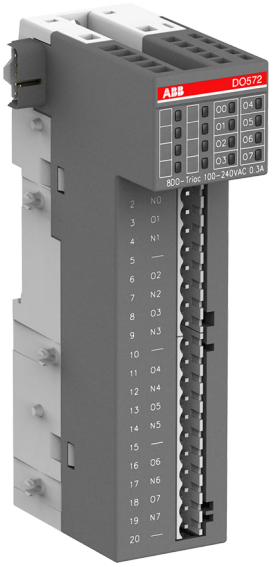


Fig. 106: Example for connection output Ox

68 DO572

- DO572



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

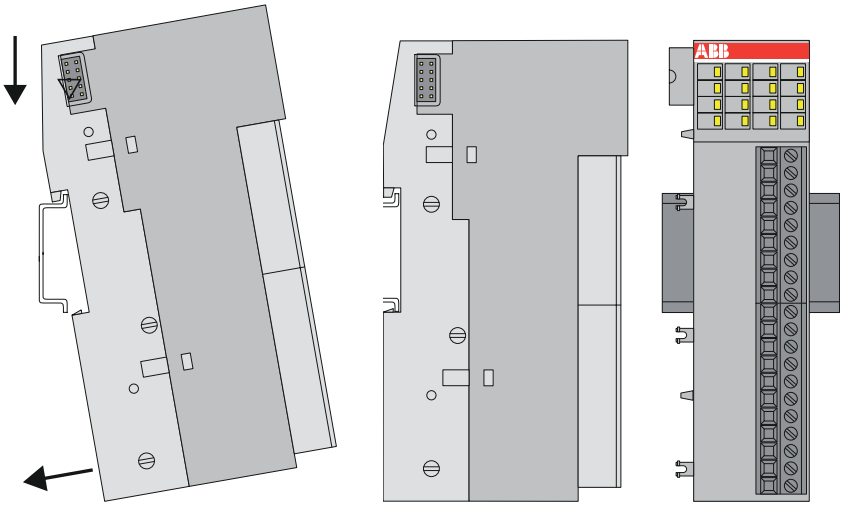
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

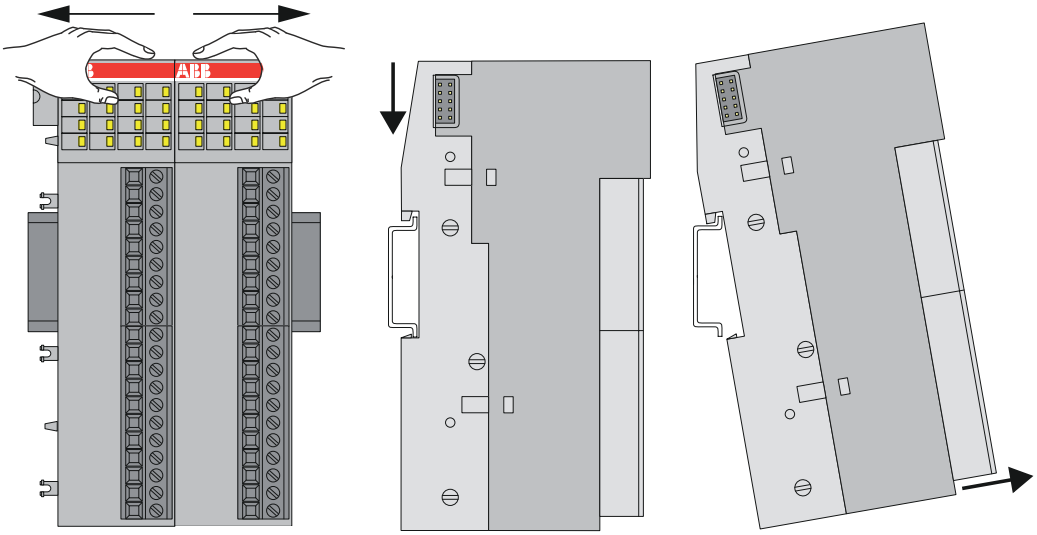
CAUTION!

Make sure that all channels are supplied from the same phase.

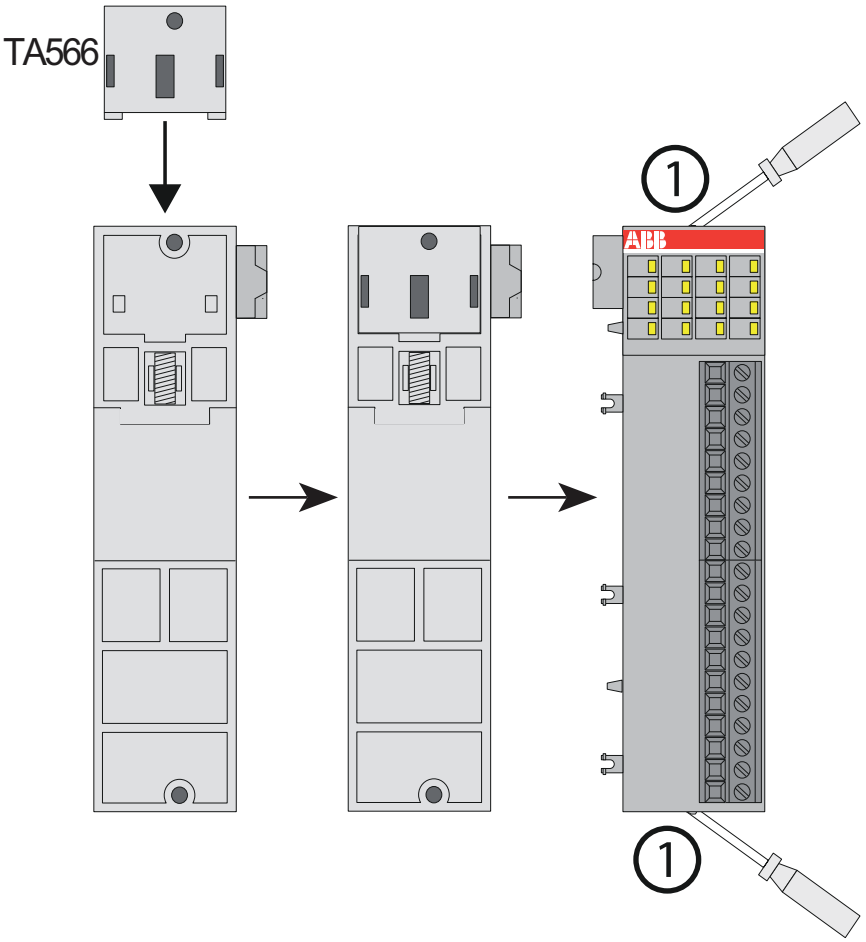
68.1 Assembly



68.2 Disassembly



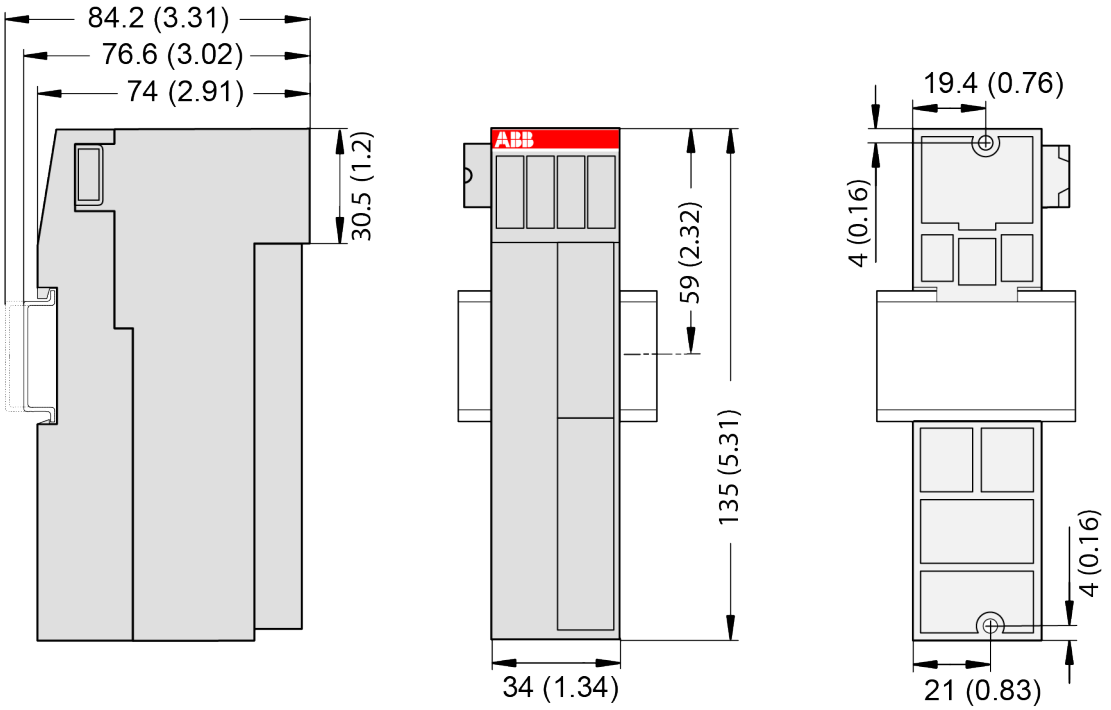
68.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

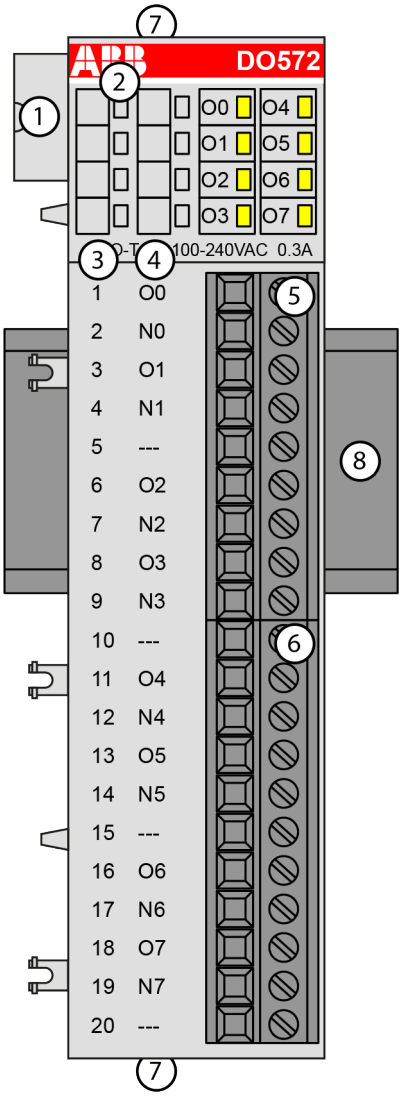
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

68.4 Dimensions



The dimensions are in mm and in brackets in inch.

68.5 Connections



1 I/O bus
2 8 yellow LEDs to display the signal states of the outputs O0 ... O7
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (9-pin)
6 Terminal block for output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

68.5.1 Outputs

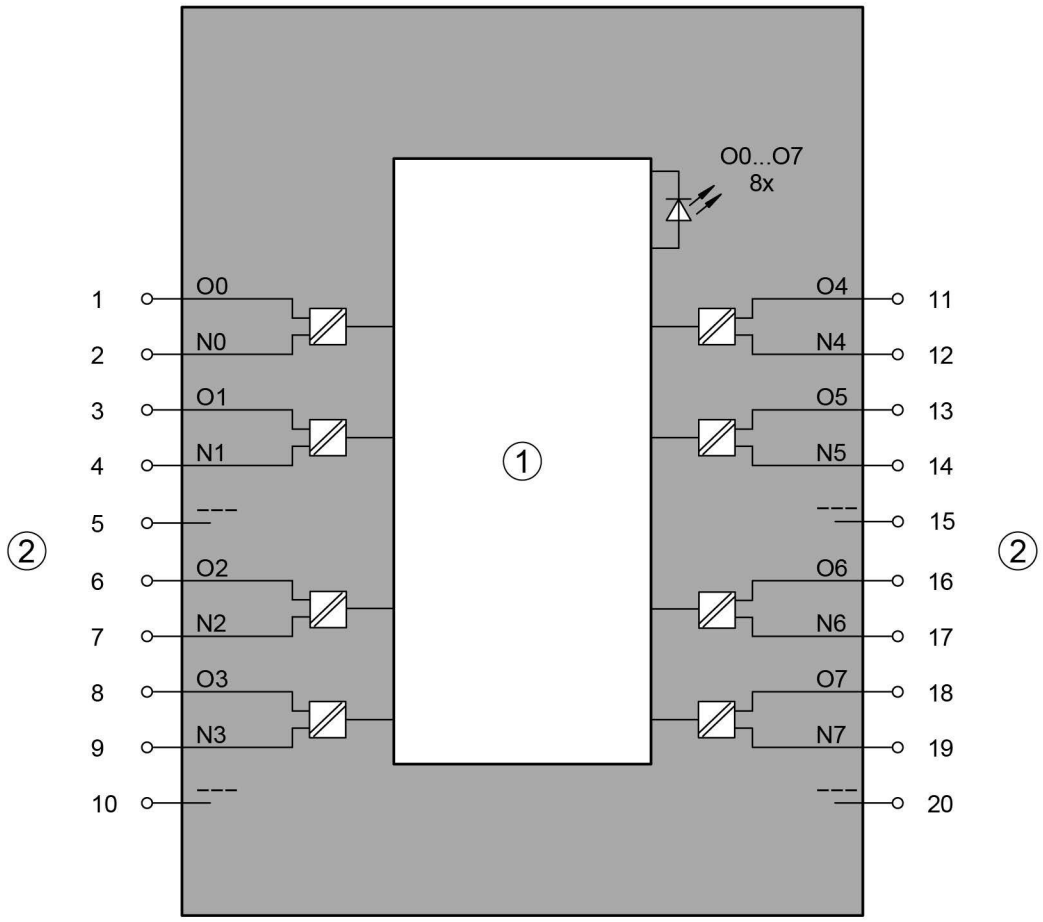


Fig. 107: Internal construction of the digital outputs

1 Logic - I/O interface
2 Digital outputs

Examples

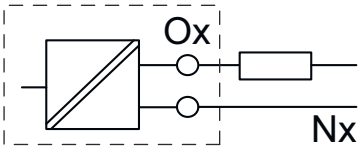


Fig. 108: Example for connection output Ox

68.6 Certification



MSIP-REI-Abb-AC500-eCoS500e

en	**Devices with KC sign on product sticker and packaging**	
ko	제품 스티커 및 포장에 **KC** 표시가 된 기기	
en	**Note** These devices correspond to:	**KN61000-6-2** “Immunity for industrial environments”, **KN61000-6-4** “Emission standard for industrial environments”
ko	참고 이러한 기기는	**KN61000-6-2 “**산업 환경에 대한 내성**”,** **KN61000-6-4 “**산업 환경 누출 기준**”**에 적합함

69 DO573

- DO573



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

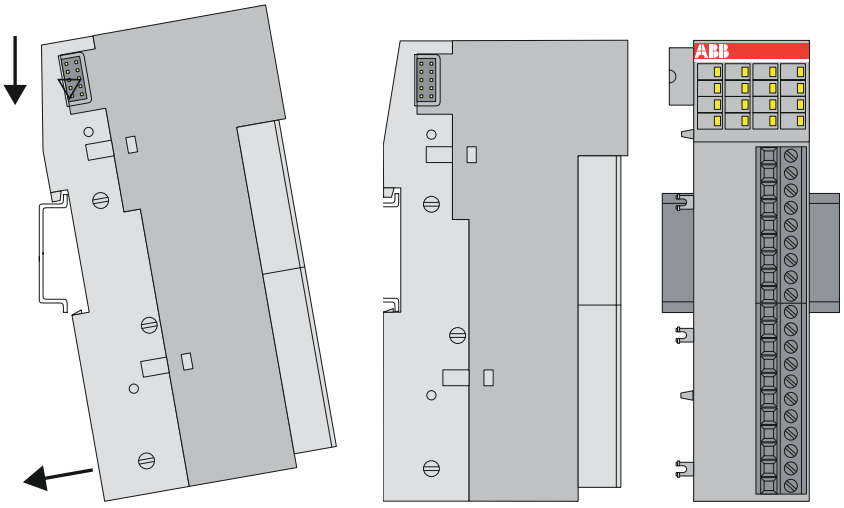
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

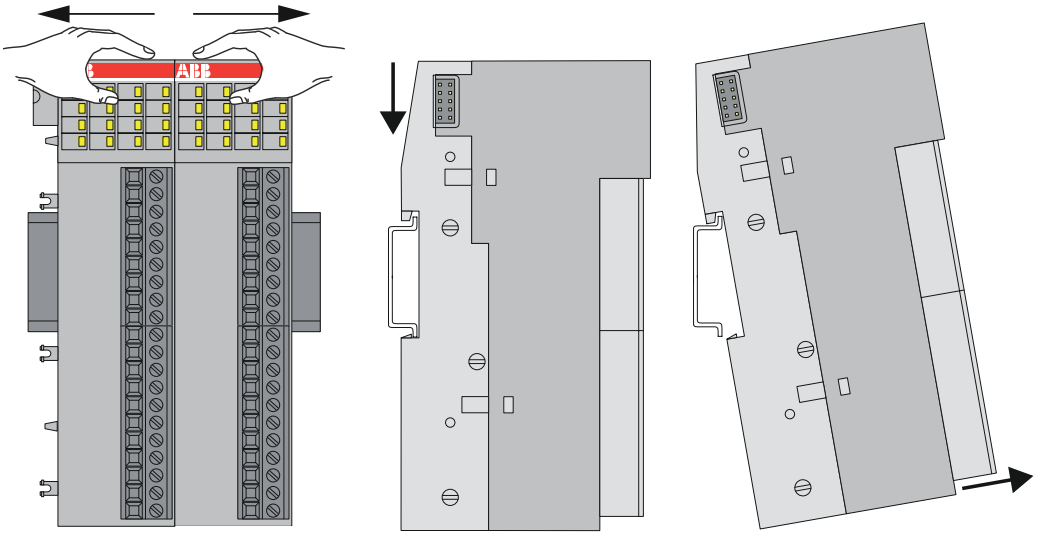
CAUTION!

Make sure that all channels are supplied from the same phase.

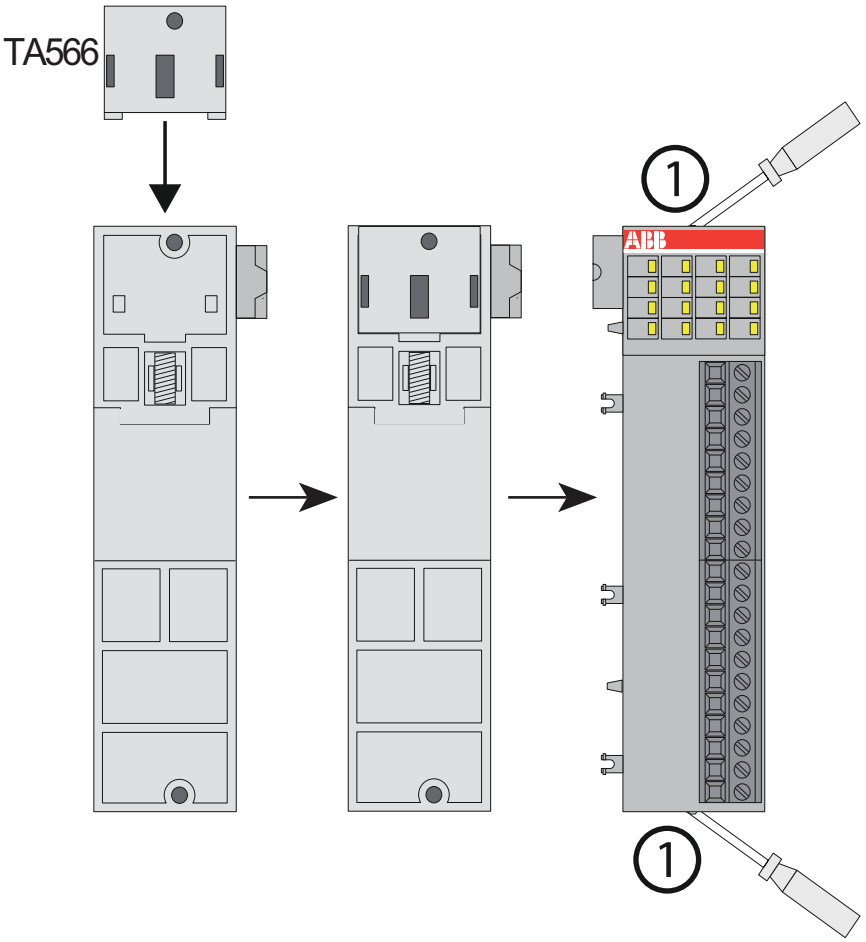
69.1 Assembly



69.2 Disassembly



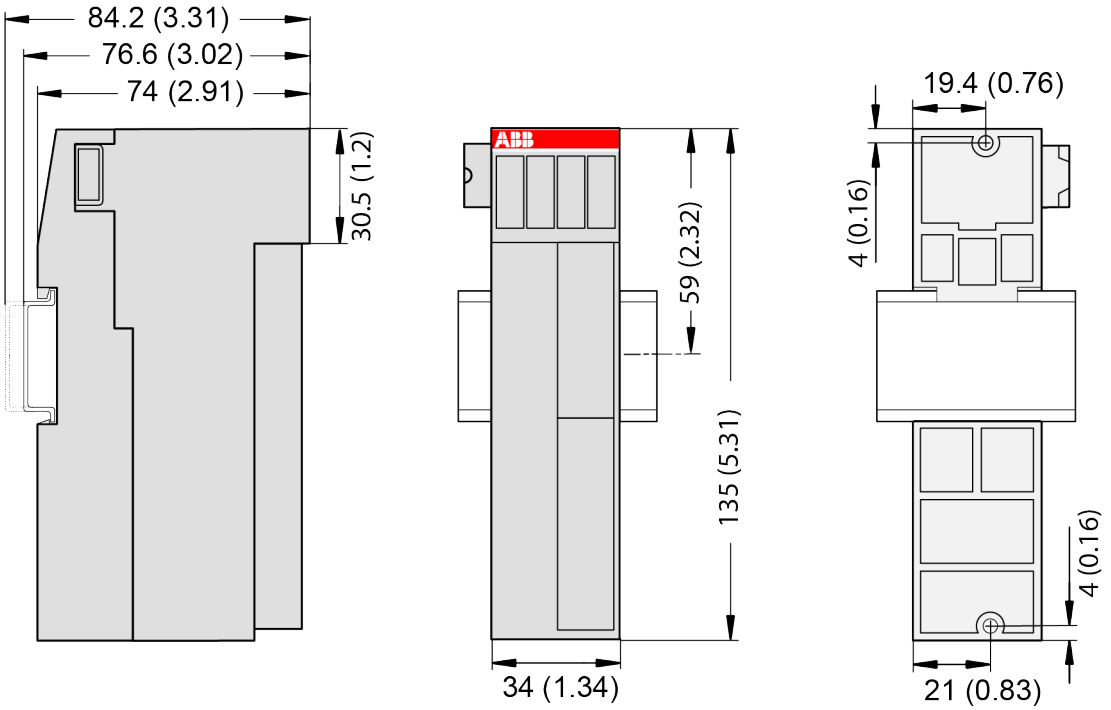
69.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

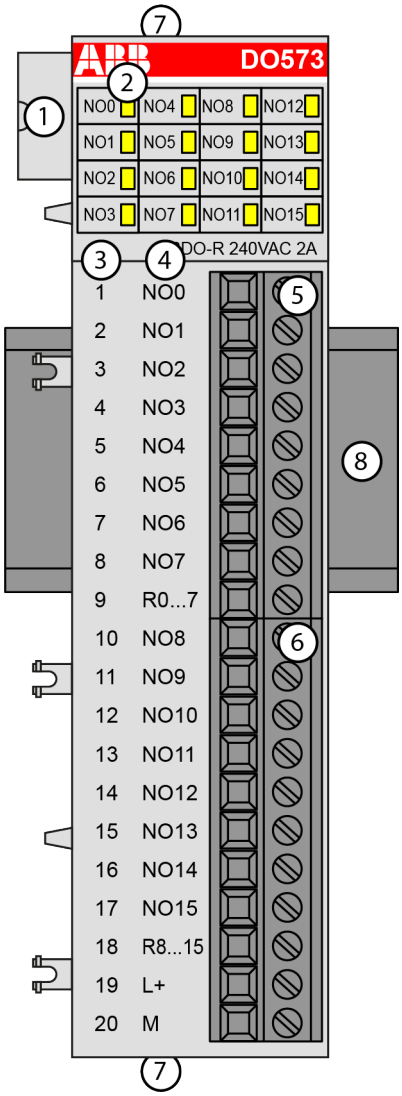
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

69.4 Dimensions



The dimensions are in mm and in brackets in inch.

69.5 Connections



1 I/O bus
2 16 yellow LEDs to display the signal states of the outputs O0 ... O15
3 Terminal number
4 Allocation of signal name
5 Terminal block for output signals (9-pin)
6 Terminal block for output signals (11-pin)
7 2 holes for wall-mounting with screws
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

69.5.1 Outputs

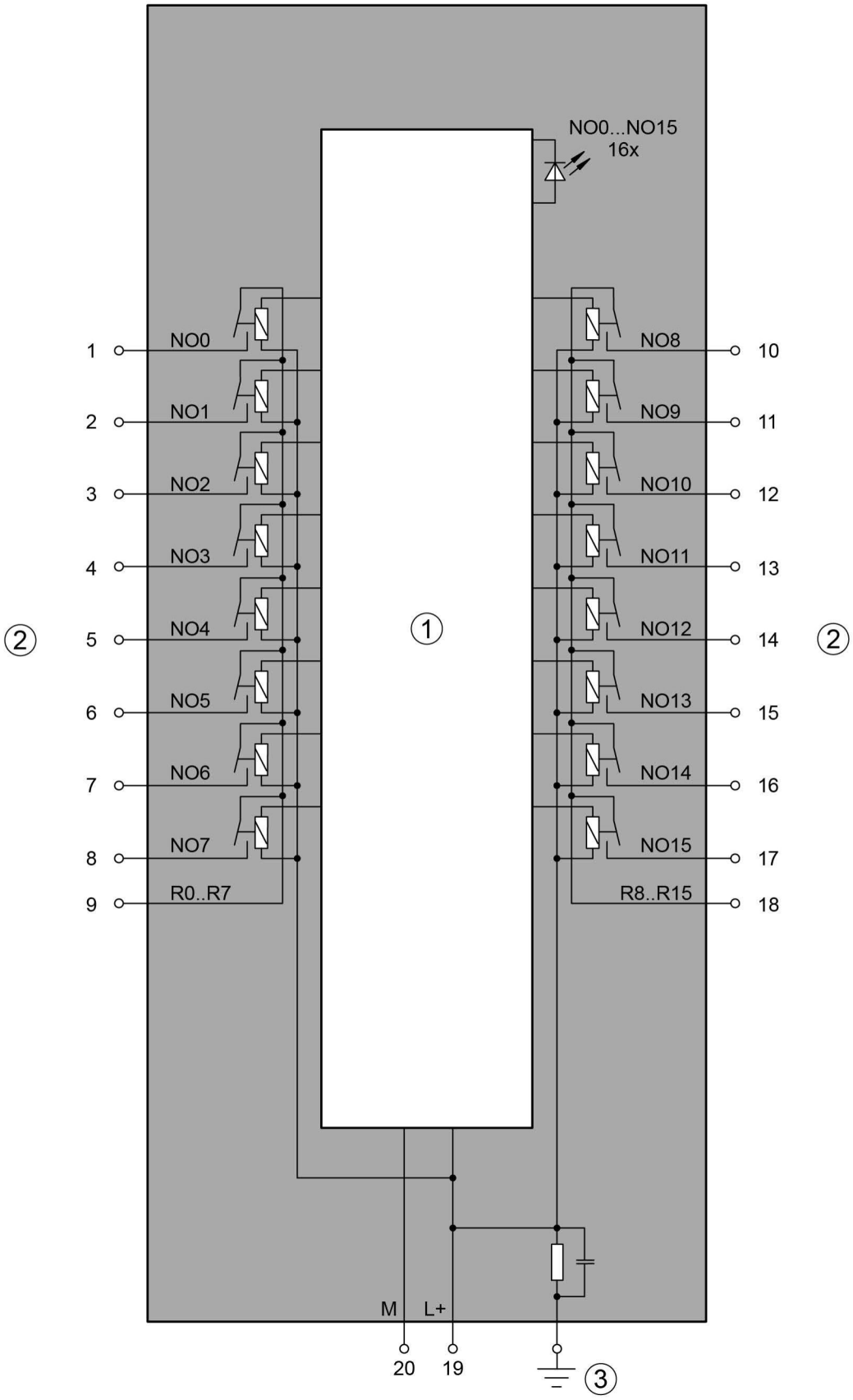


Fig. 109: Internal construction of the digital outputs

1 Logic - I/O bus interface
2 Digital outputs
3 Functional earth connection

Examples

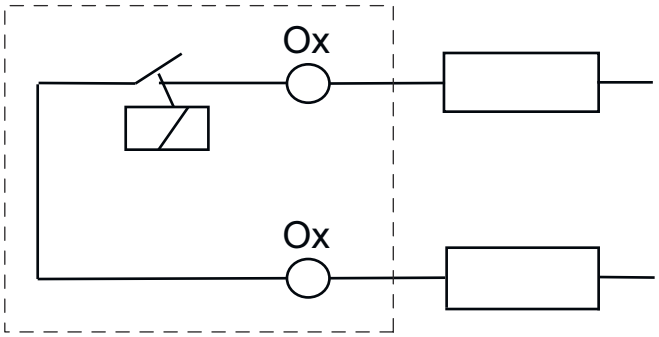


Fig. 110: Example for connection output Ox

70 DX522(-XC)

- DX522
- DX522-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

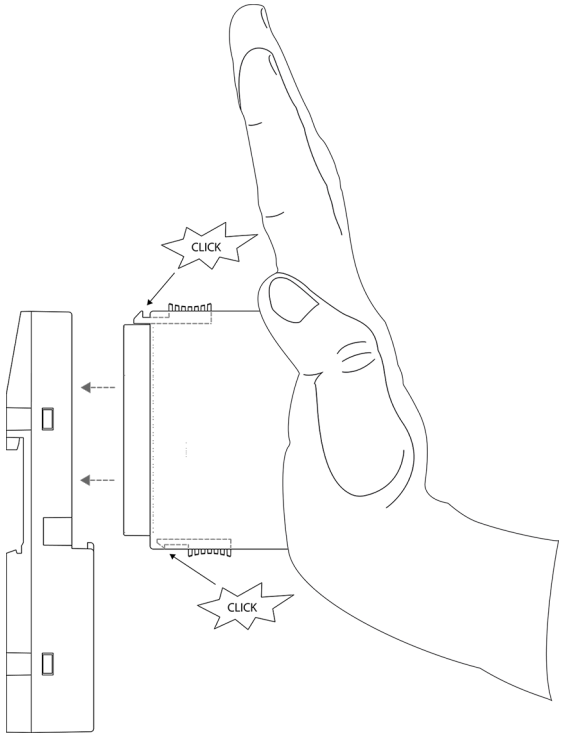
NOTICE!

Hot swap

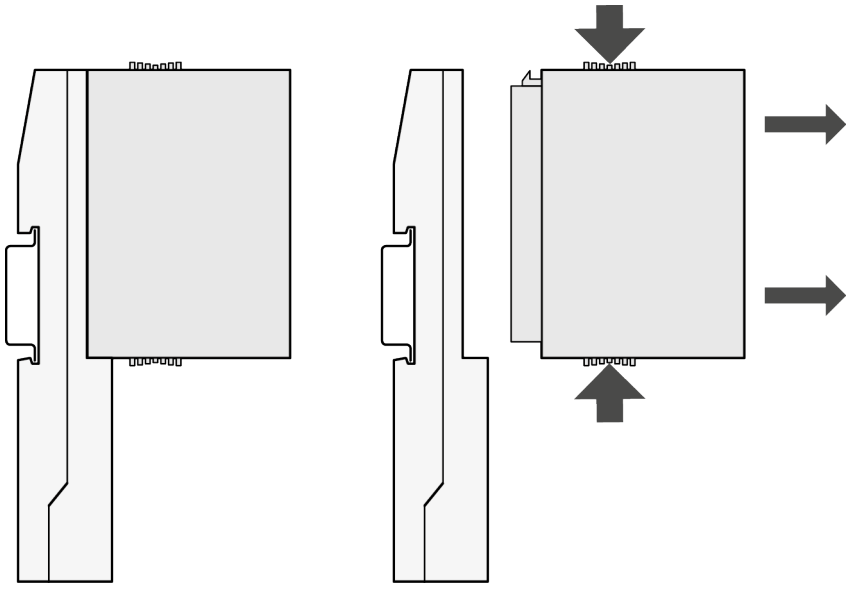
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

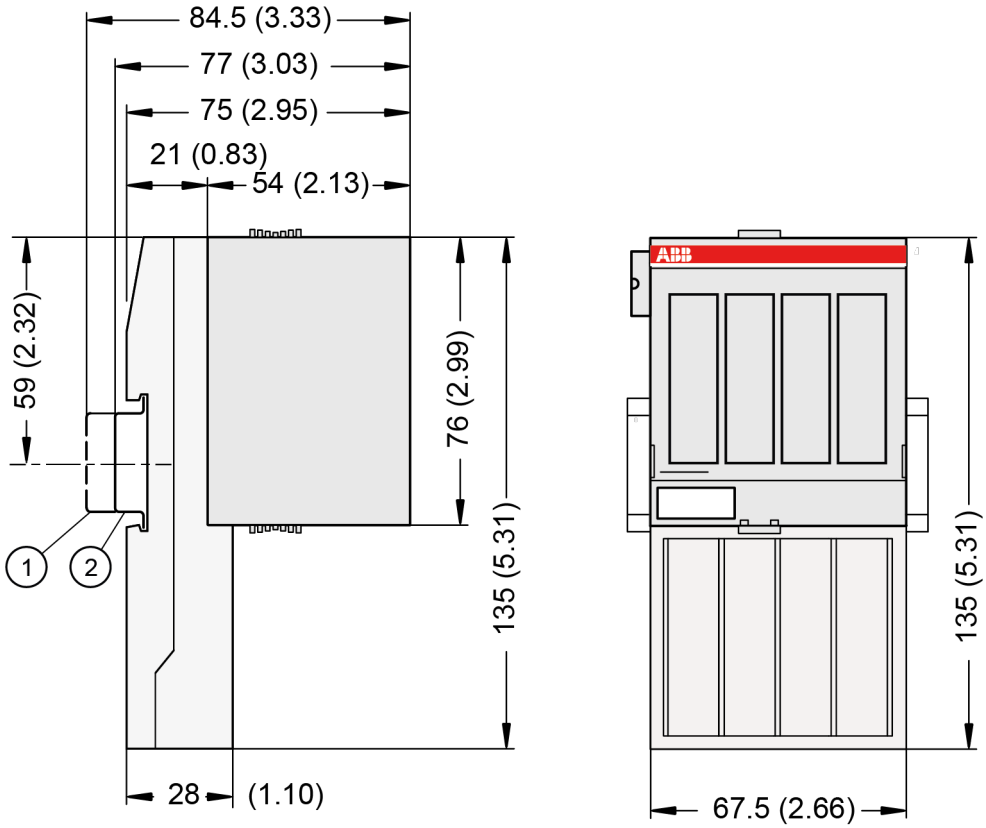
70.1 Assembly



70.2 Disassembly



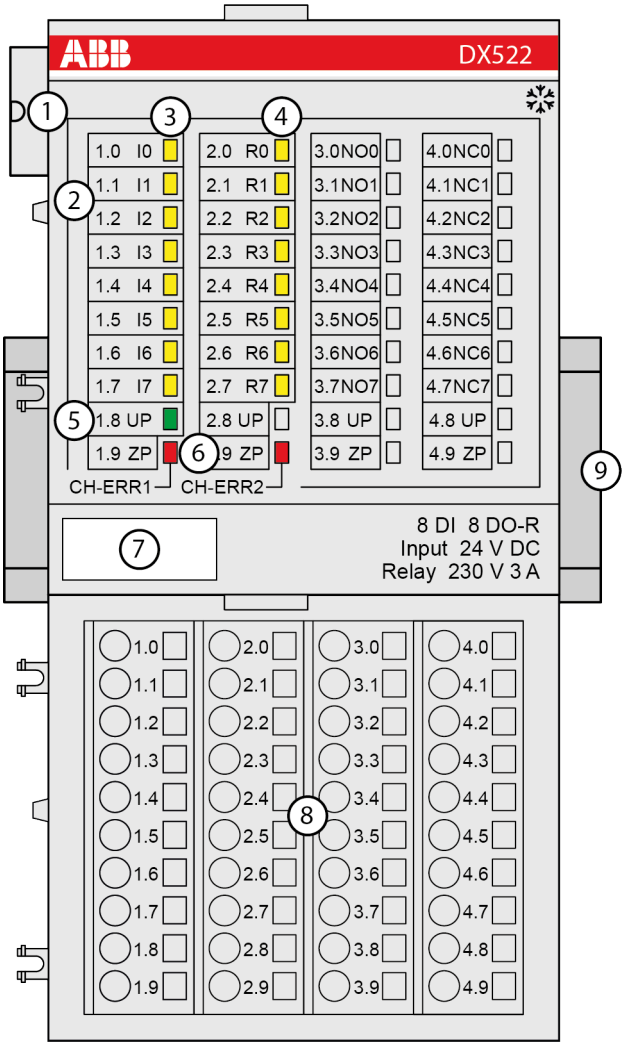
70.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

70.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states at the digital inputs (I0 ... I7)
4 8 yellow LEDs to display the signal states at the digital relay outputs (R0 ... R7)
5 1 green LED to display the state of the process supply voltage UP
6 2 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

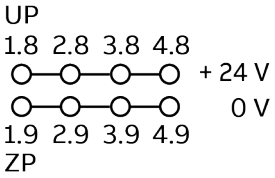
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

NOTICE!

Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

70.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

70.4.2 Inputs/Outputs

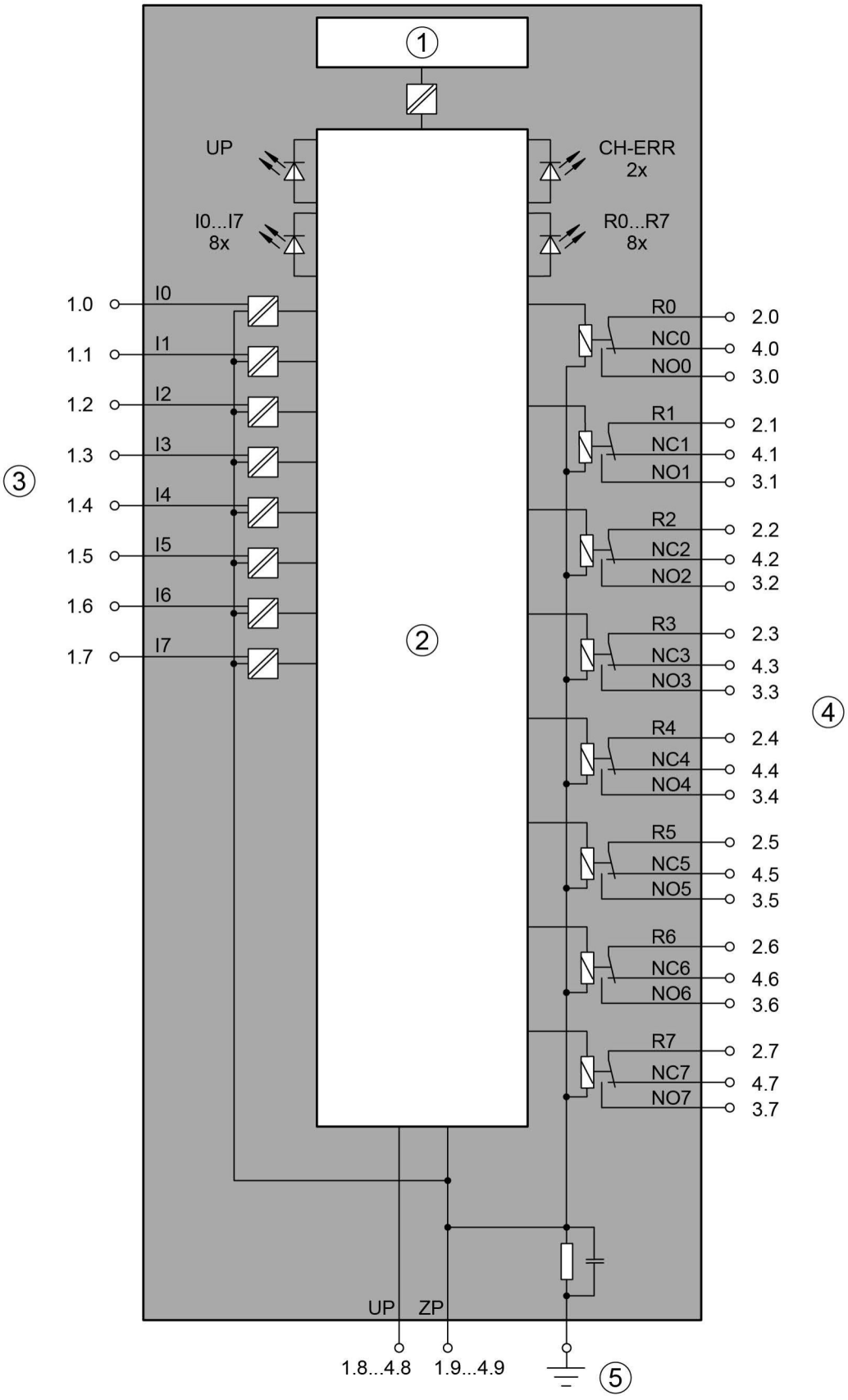


Fig. 111: Connection of the digital inputs/outputs

1 I/O bus
2 Logic

3 Digital inputs
4 Digital outputs
5 Functional earth connection

Example

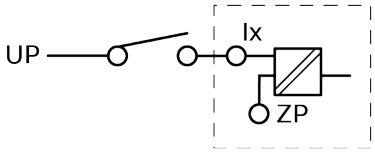


Fig. 112: Example of connection input

If the relay outputs have to switch inductive DC loads, free-wheeling diodes must be circuited in parallel to these loads.

If the relay outputs have to switch inductive AC loads, spark suppressors are required.

71 DX531

- DX531



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

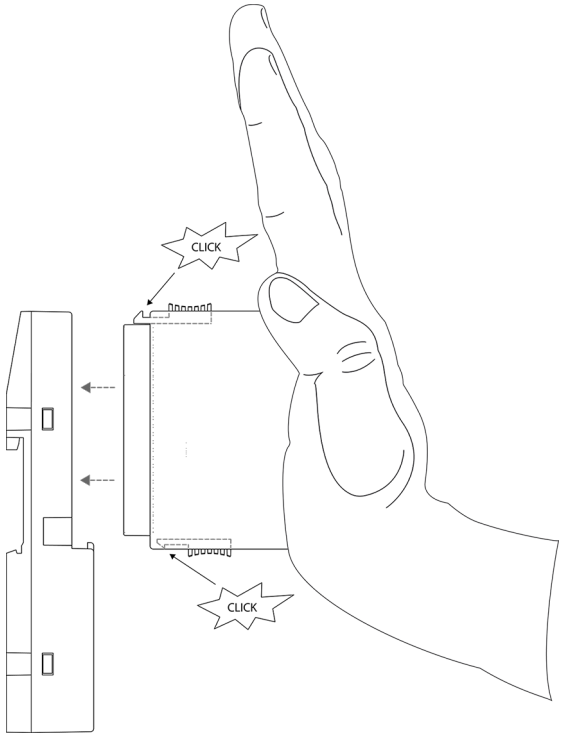
NOTICE!

Hot swap

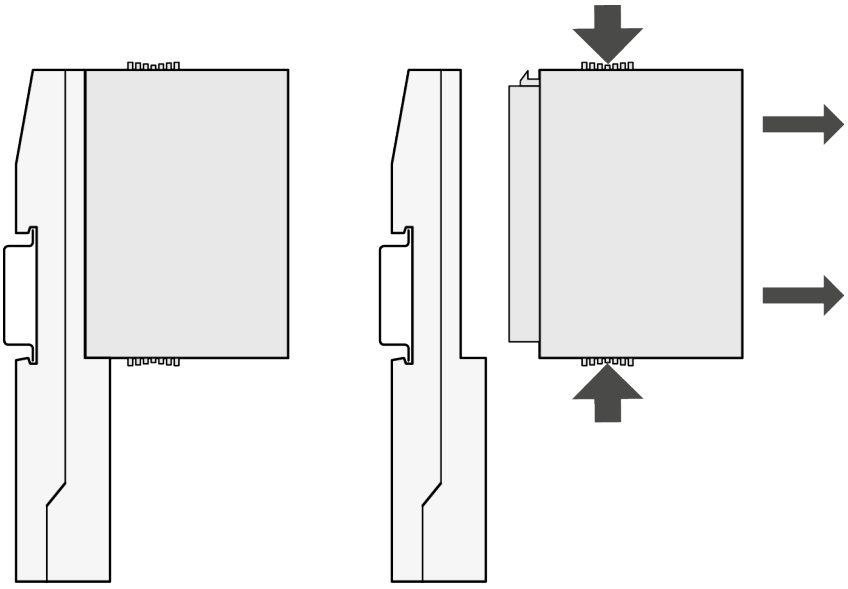
Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

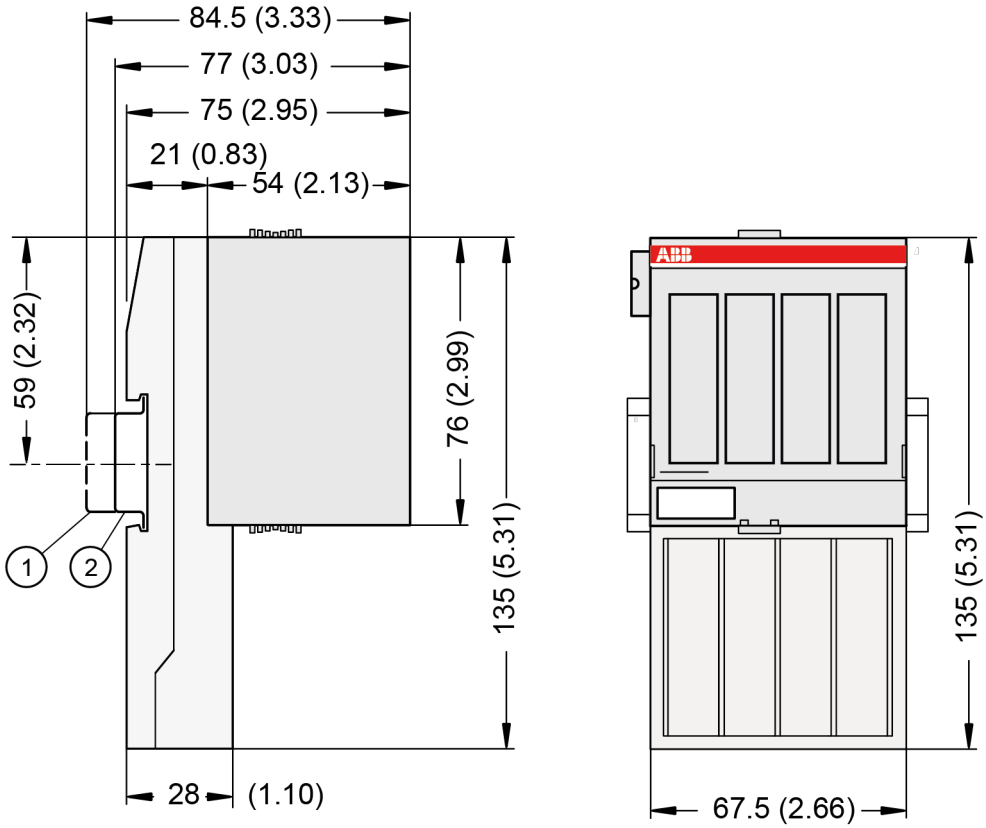
71.1 Assembly



71.2 Disassembly



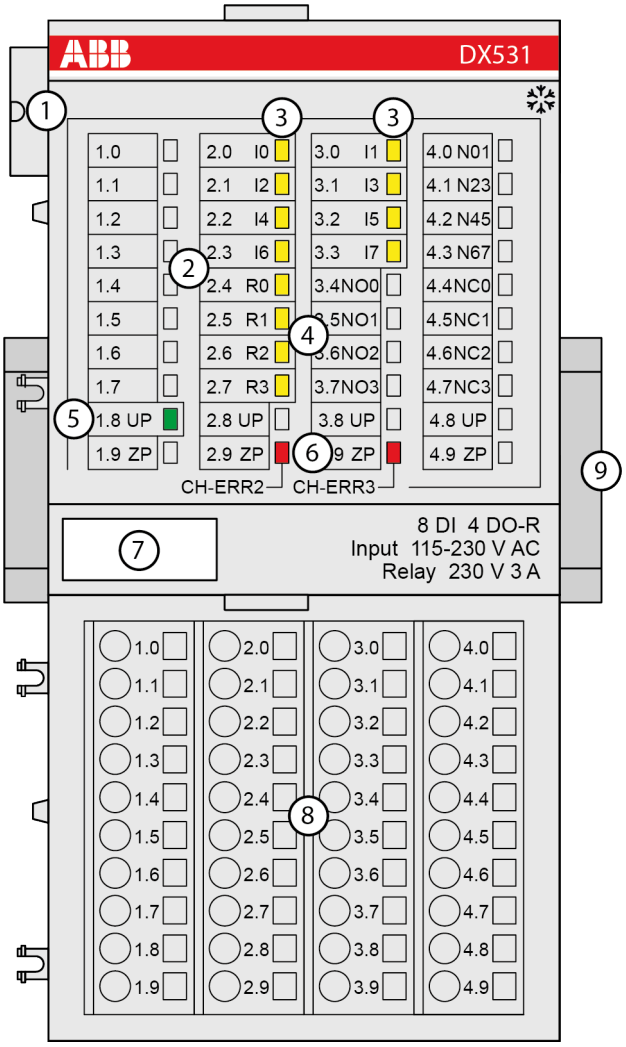
71.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

71.4 Connections



1 I/O bus
2 Allocation between terminal number and signal name
3 8 yellow LEDs to display the signal states at the digital inputs (I0 ... I7)
4 4 yellow LEDs to display the signal states at the digital relay outputs (R0 ... R3)
5 1 green LED to display the state of the process supply voltage UP
6 2 red LEDs to display errors
7 Label
8 Terminal unit
9 DIN rail
❄ Sign for XC version

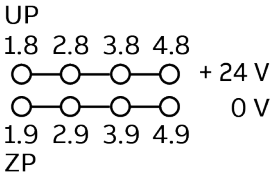
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

NOTICE!

Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

71.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

71.4.2 Inputs/Outputs

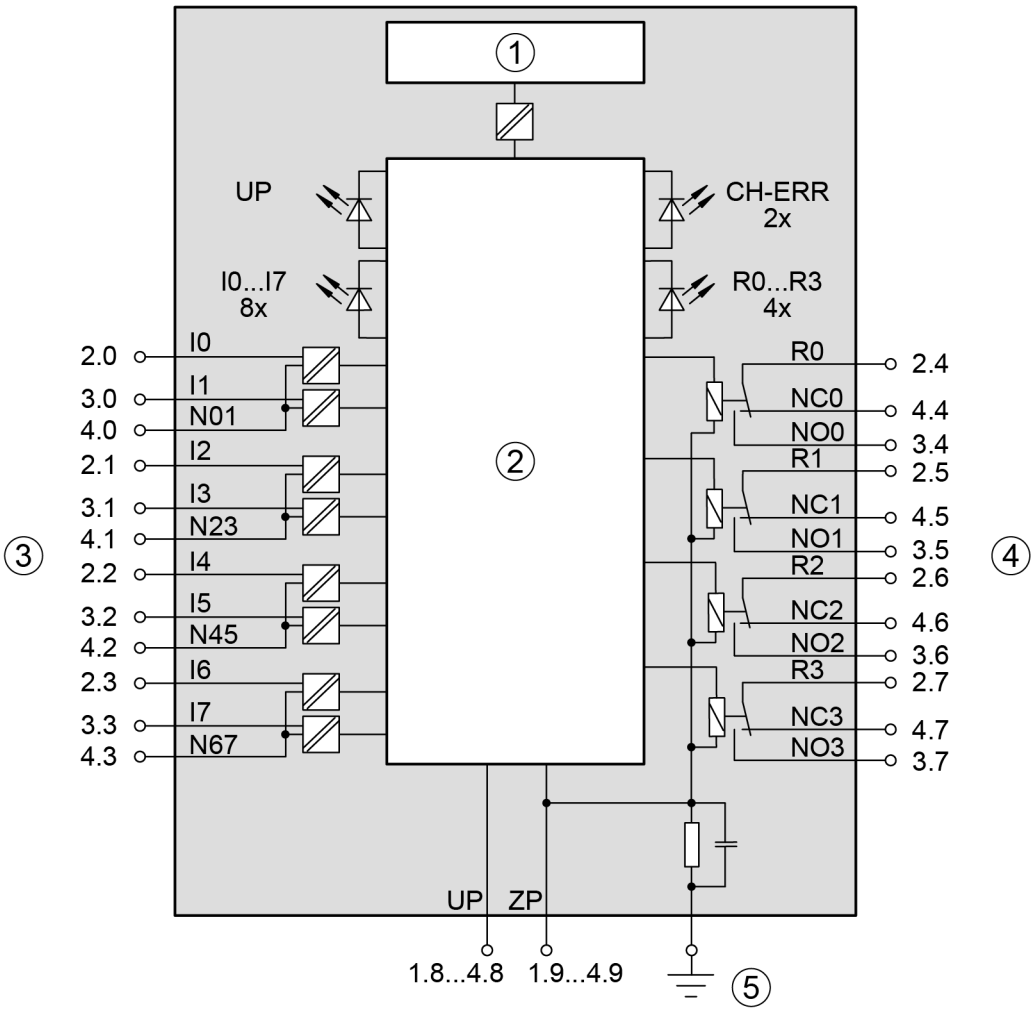


Fig. 113: Internal construction

1 I/O bus interface
2 Logic
3 Digital inputs
4 Relay output
5 Functional earth connection



If the relay outputs have to switch inductive DC loads, free-wheeling diodes must be circuited in parallel to these loads.



If the relay outputs have to switch inductive AC loads, spark suppressors are required.

72 DX561

- DX561



CAUTION!

Risk of injury and damaging the product!

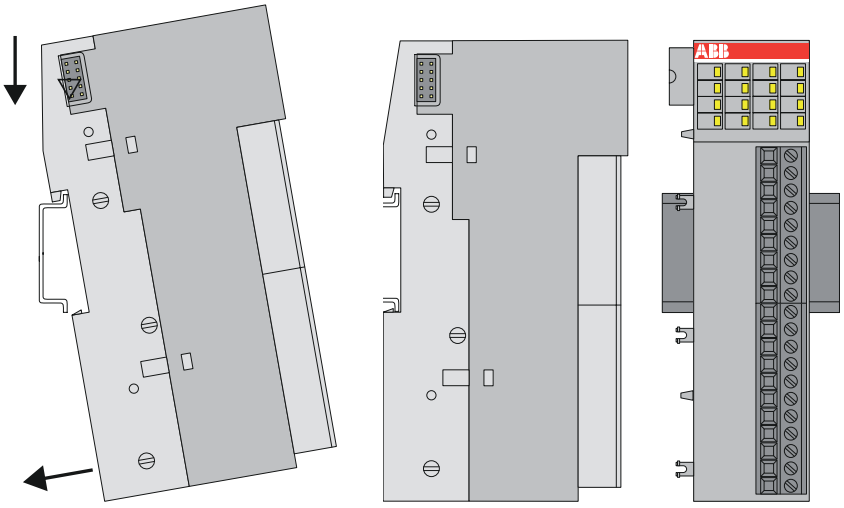
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

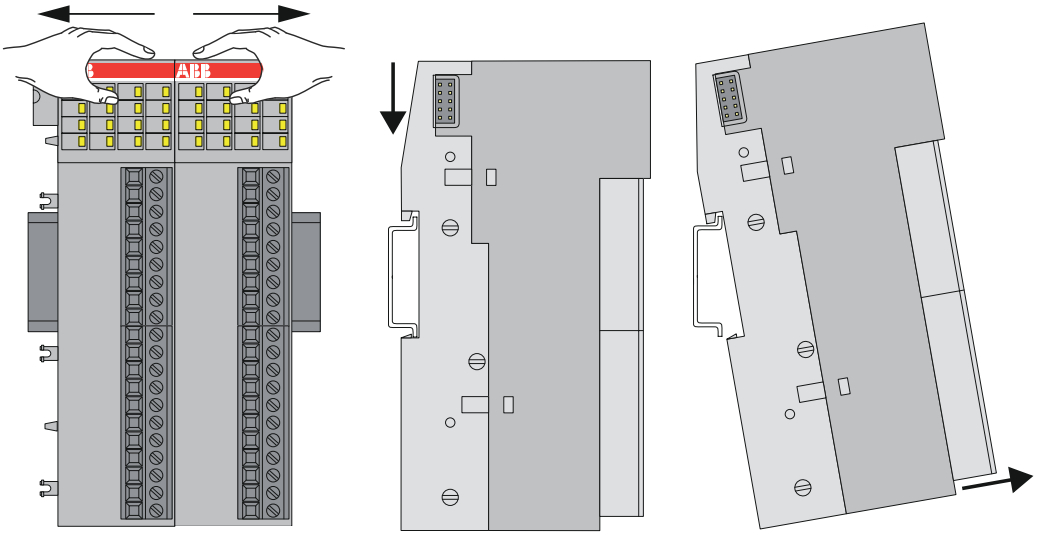
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

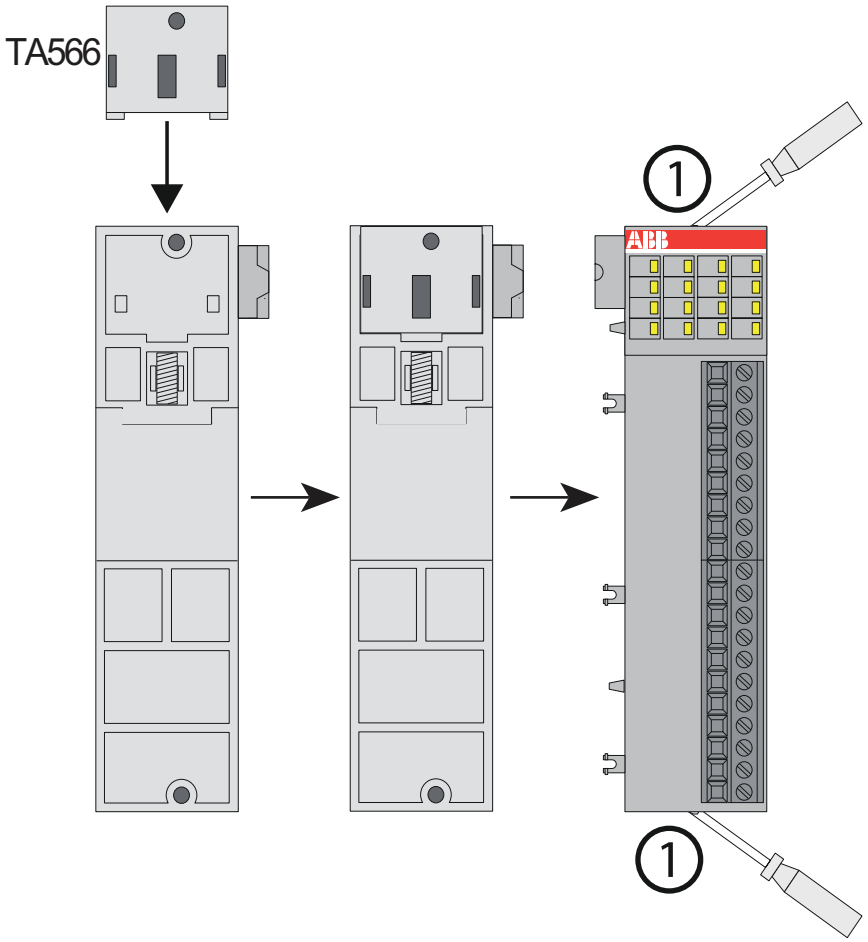
72.1 Assembly



72.2 Disassembly



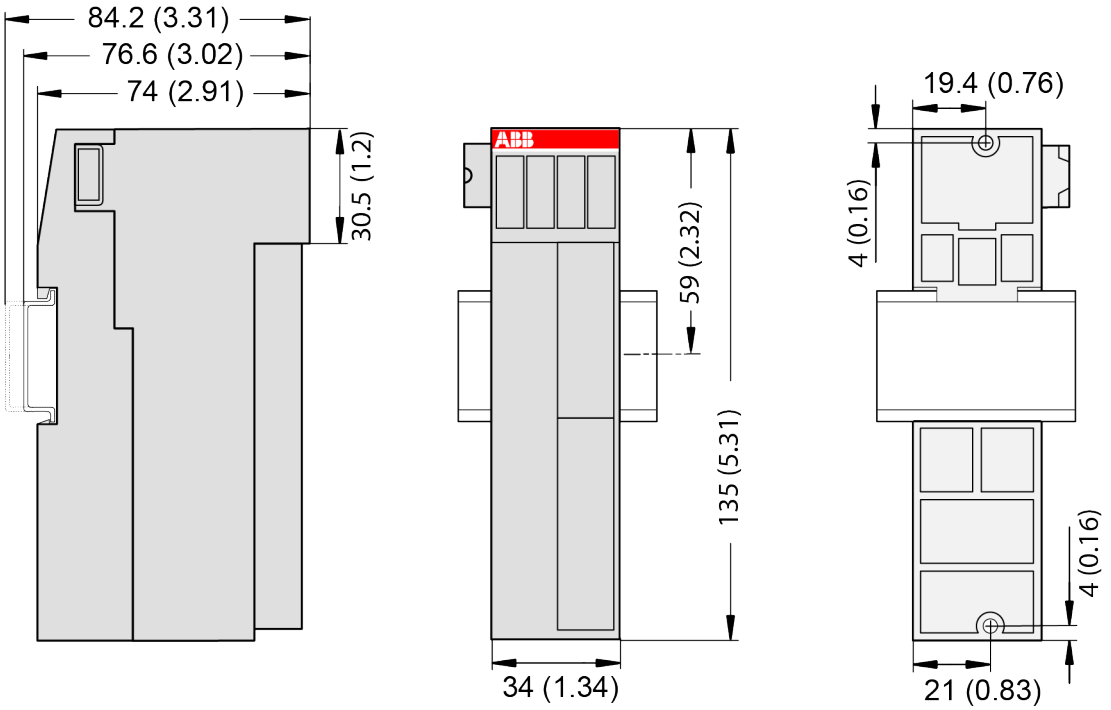
72.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

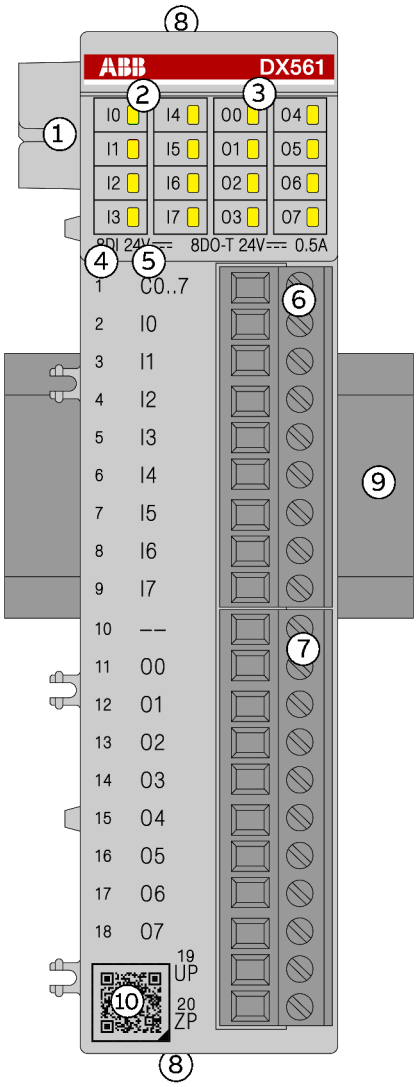
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

72.4 Dimensions



The dimensions are in mm and in brackets in inch.

72.5 Connections



1 I/O bus
2 8 yellow LEDs to display the signal states of the inputs I0 ... I7
3 8 yellow LEDs to display the signal states of the outputs O0 ... O7
4 Terminal number
5 Allocation of signal name
6 Terminal block for input signals (9-pin)
7 Terminal block for output signals (11-pin)
8 2 holes for wall-mounting with screws
9 DIN rail
10 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front

6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

72.5.1 Inputs/Outputs

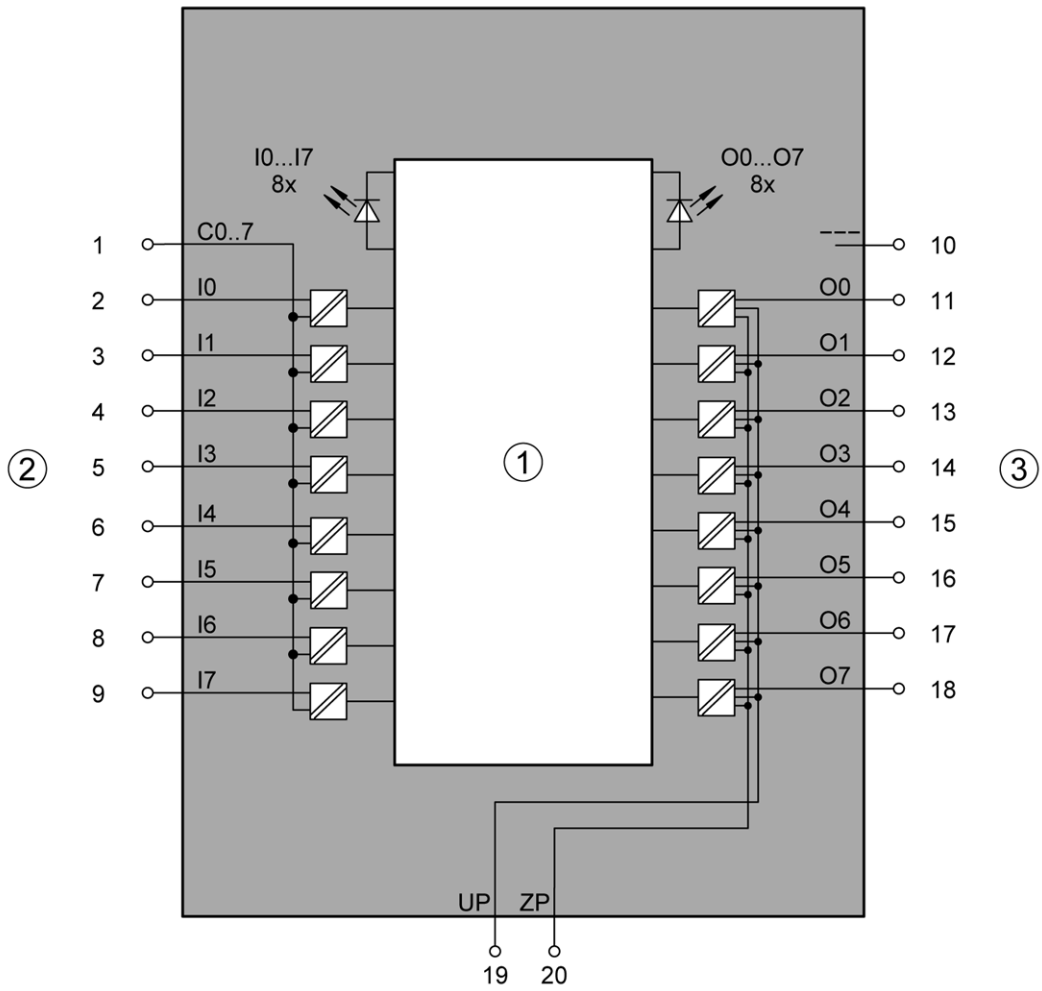


Fig. 114: Internal construction of the digital inputs and outputs

1 Logic - I/O interface
2 Digital inputs
3 Digital outputs
4 Functional earth connection

Examples

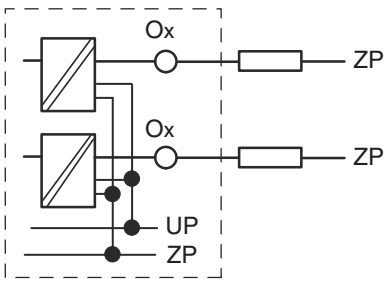


Fig. 115: Example for connection output Ox

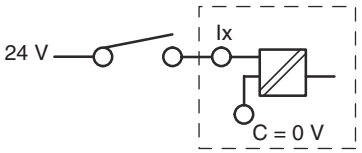


Fig. 116: DX561 used as source inputs

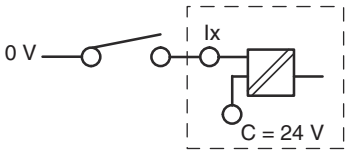


Fig. 117: DX561 used as sink inputs

73 DX571

- DX571



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

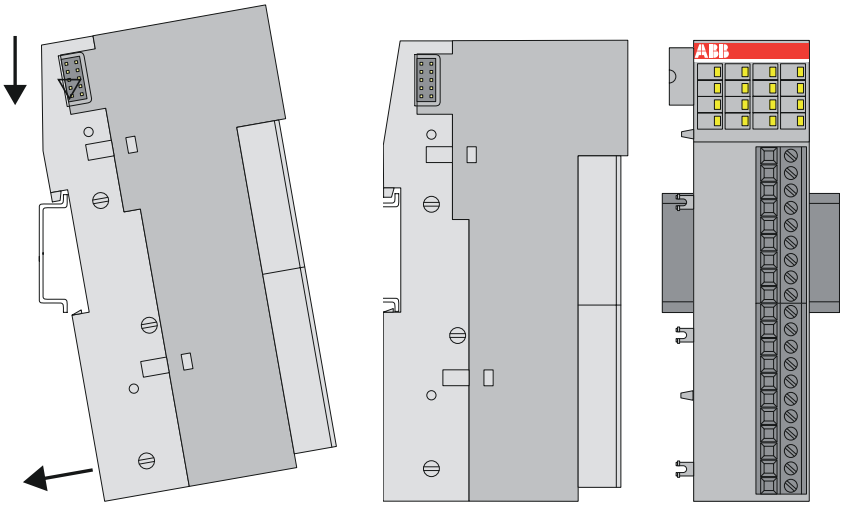
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

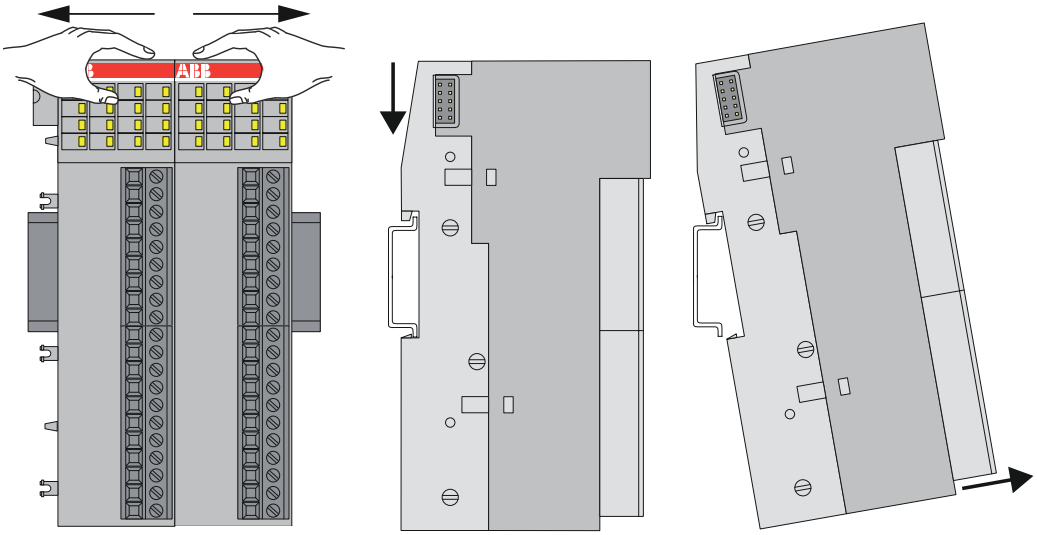
CAUTION!

Make sure that all channels are supplied from the same phase.

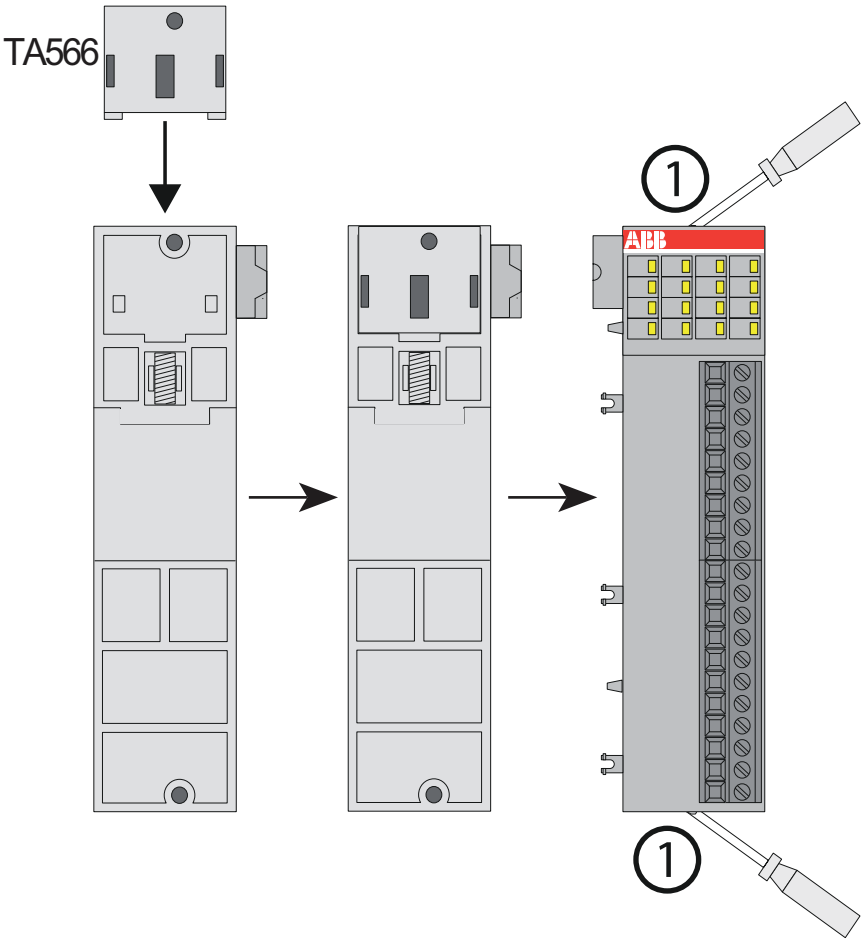
73.1 Assembly



73.2 Disassembly



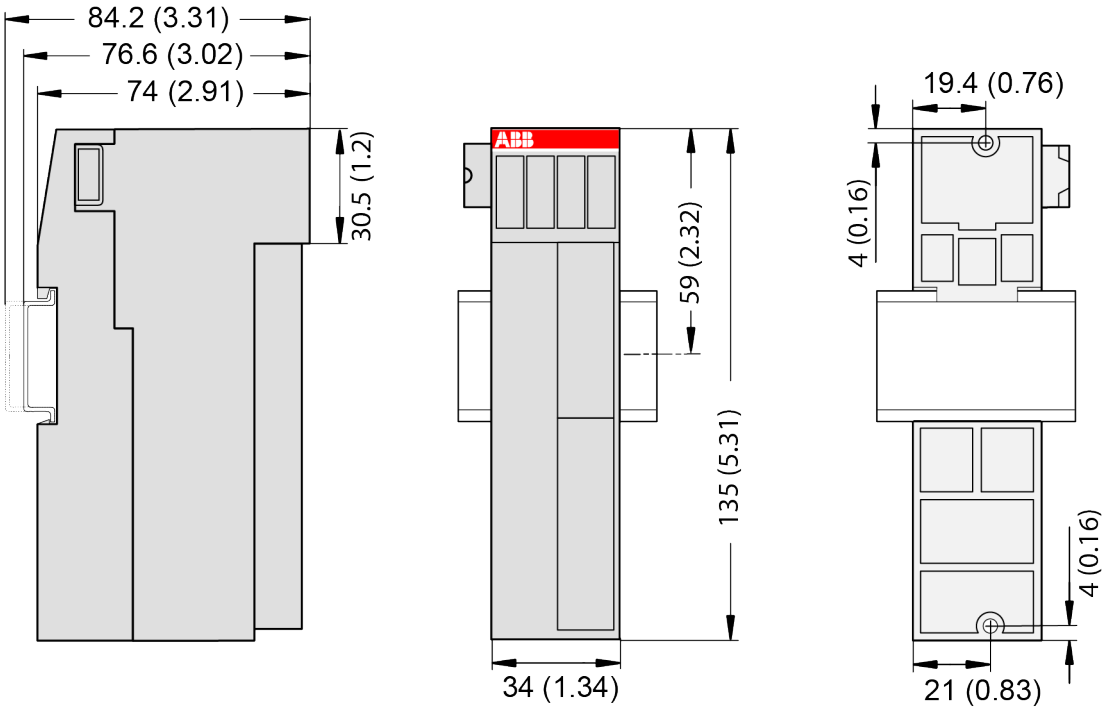
73.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

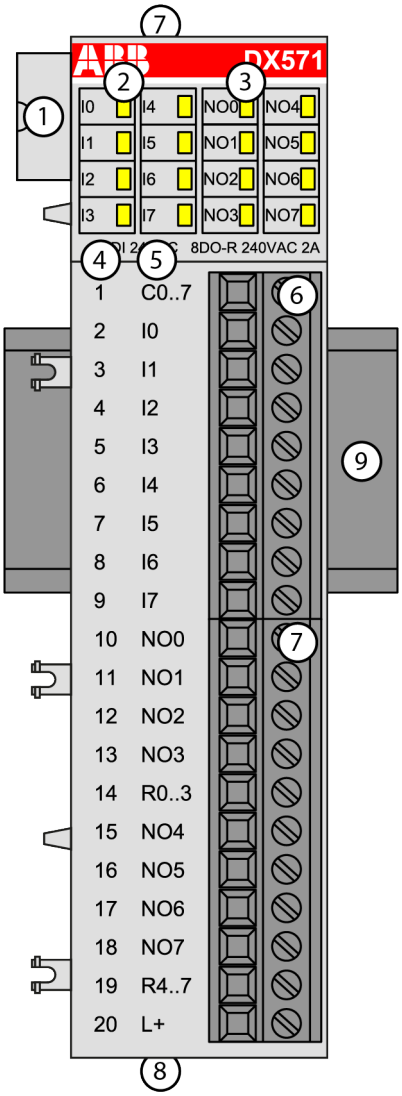
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

73.4 Dimensions



The dimensions are in mm and in brackets in inch.

73.5 Connections

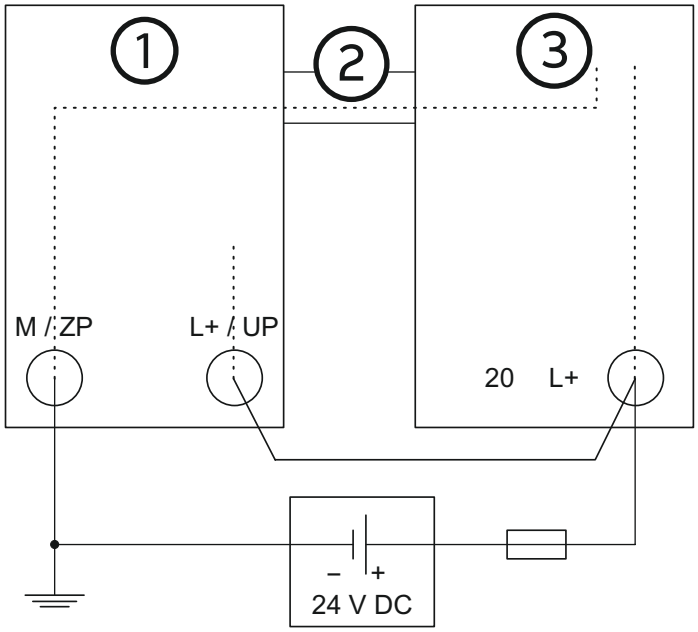


1 I/O bus
2 8 yellow LEDs to display the signal states of the inputs I0 ... I7
3 8 yellow LEDs to display the signal states of the outputs NO0 ... NO7
4 Terminal number
5 Allocation of signal name
6 Terminal block for input signals (9-pin)
7 Terminal block for output signals (11-pin)
8 2 holes for wall-mounting with screws
9 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side

	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front



1 CPU or communication interface module
2 I/O bus
3 DO571

73.5.1 Inputs/Outputs

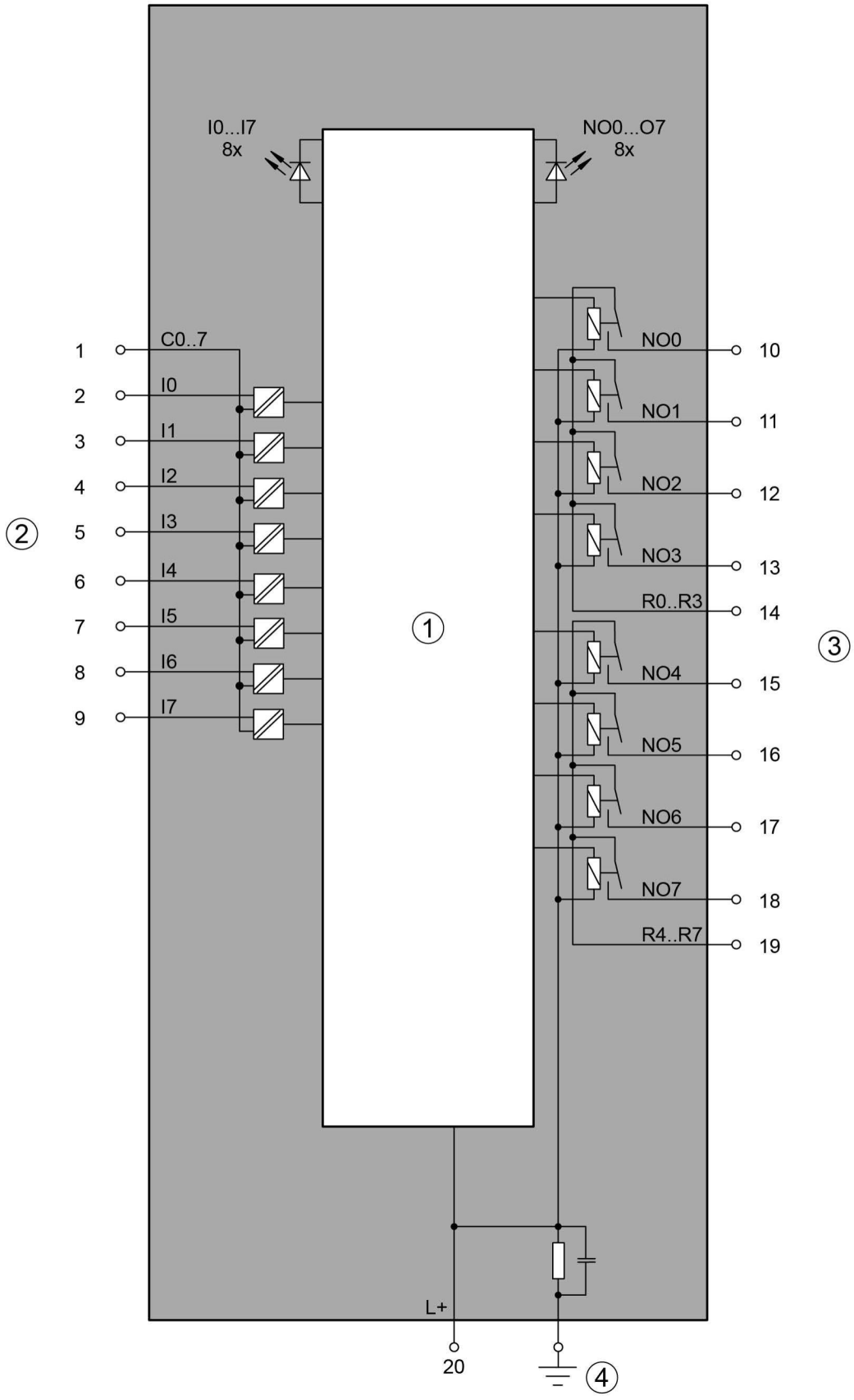


Fig. 118: Internal construction of the digital inputs and outputs

1 Logic - I/O inteface
2 Digital inputs
3 Digital outputs
4 Functional earth connection

Examples

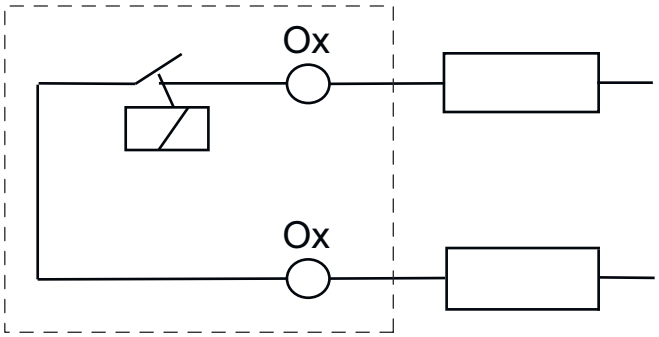


Fig. 119: Example for connection output Ox

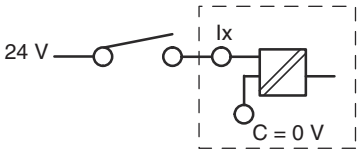


Fig. 120: DX571 used as source inputs

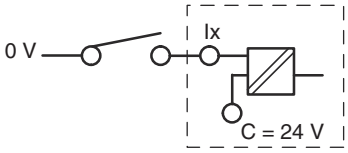
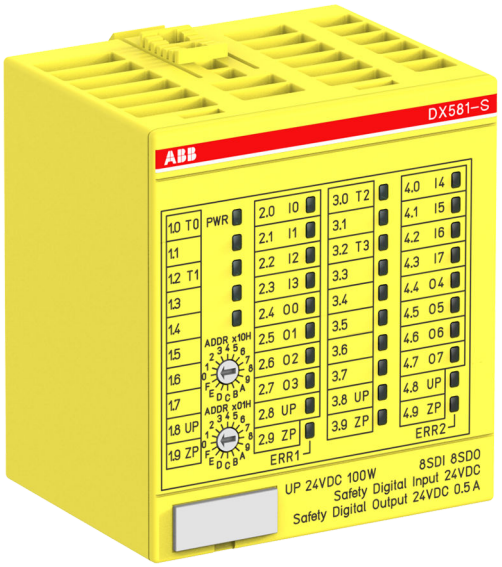


Fig. 121: DX571 used as sink inputs

74 DX581-S(-XC)

- DX581-S
- DX581-S-XC



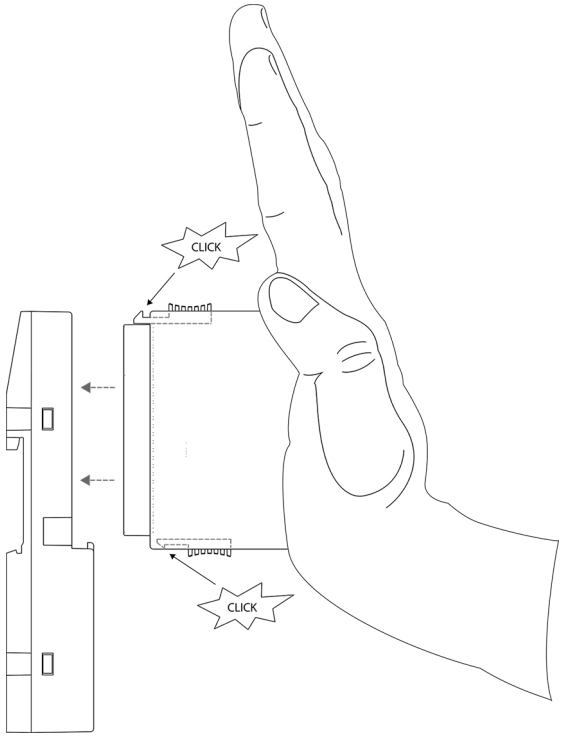
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

74.1 Assembly

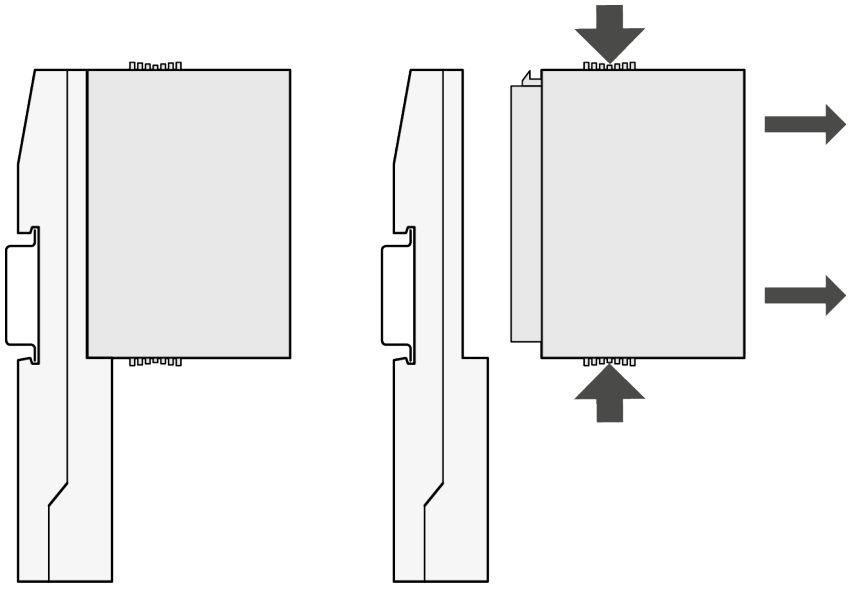


1. Put the module on the terminal unit

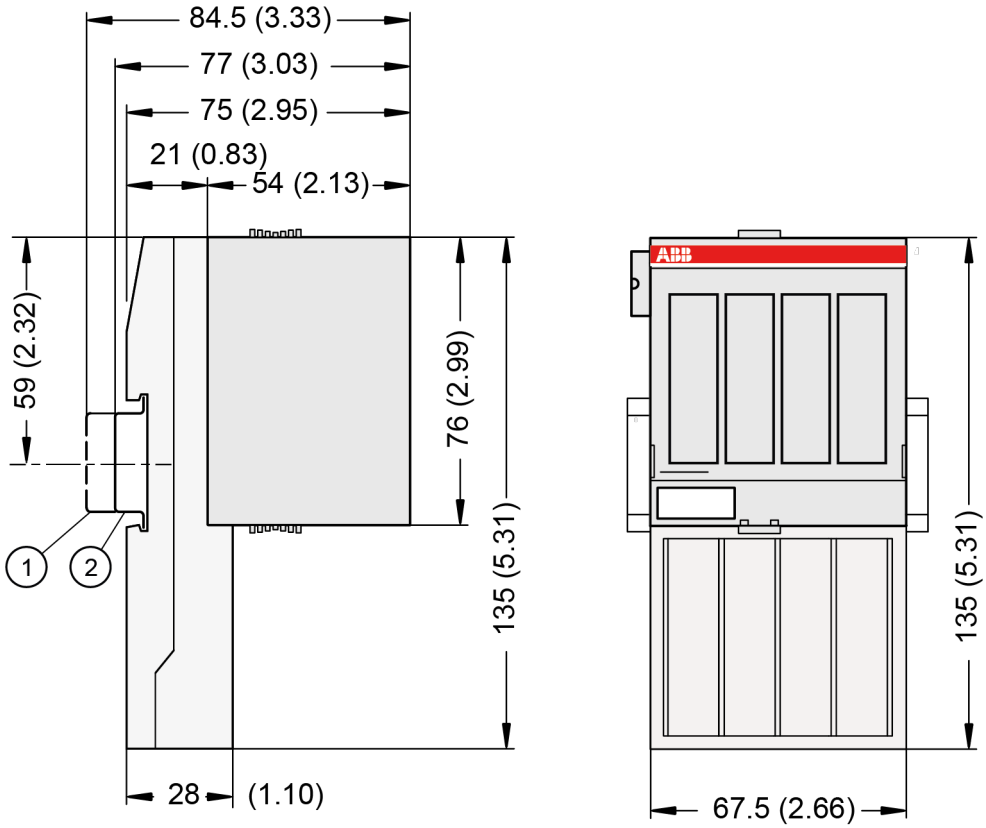
   ⇨ Module clicks in.

2. Then press the module with a force of at least 100 N into the terminal unit to achieve proper electrical contact.

74.2 Disassembly



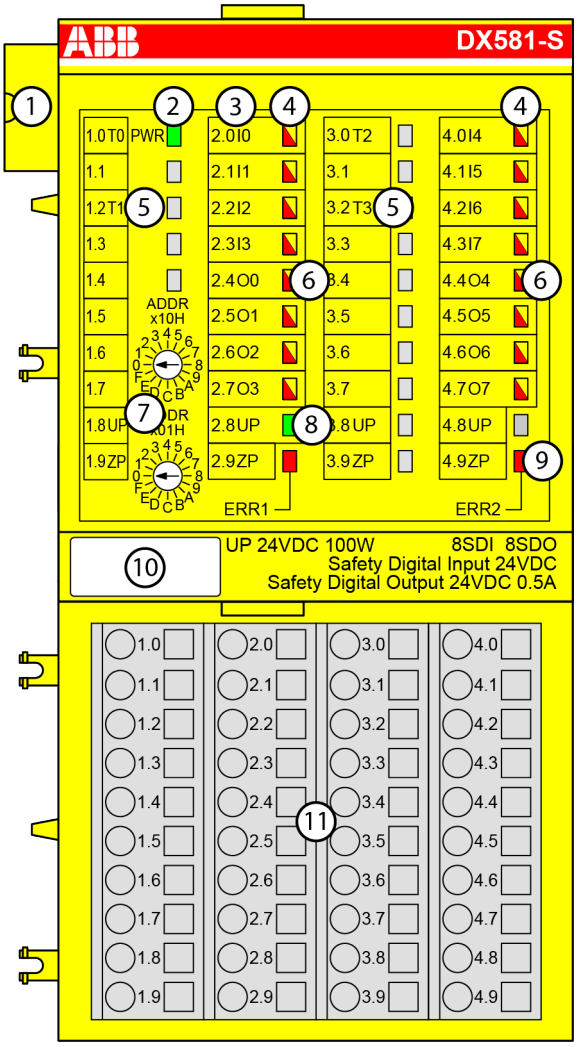
74.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

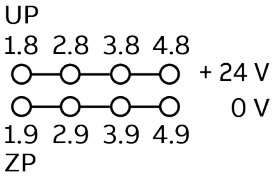
The dimensions are in mm and in brackets in inch.

74.4 Connections



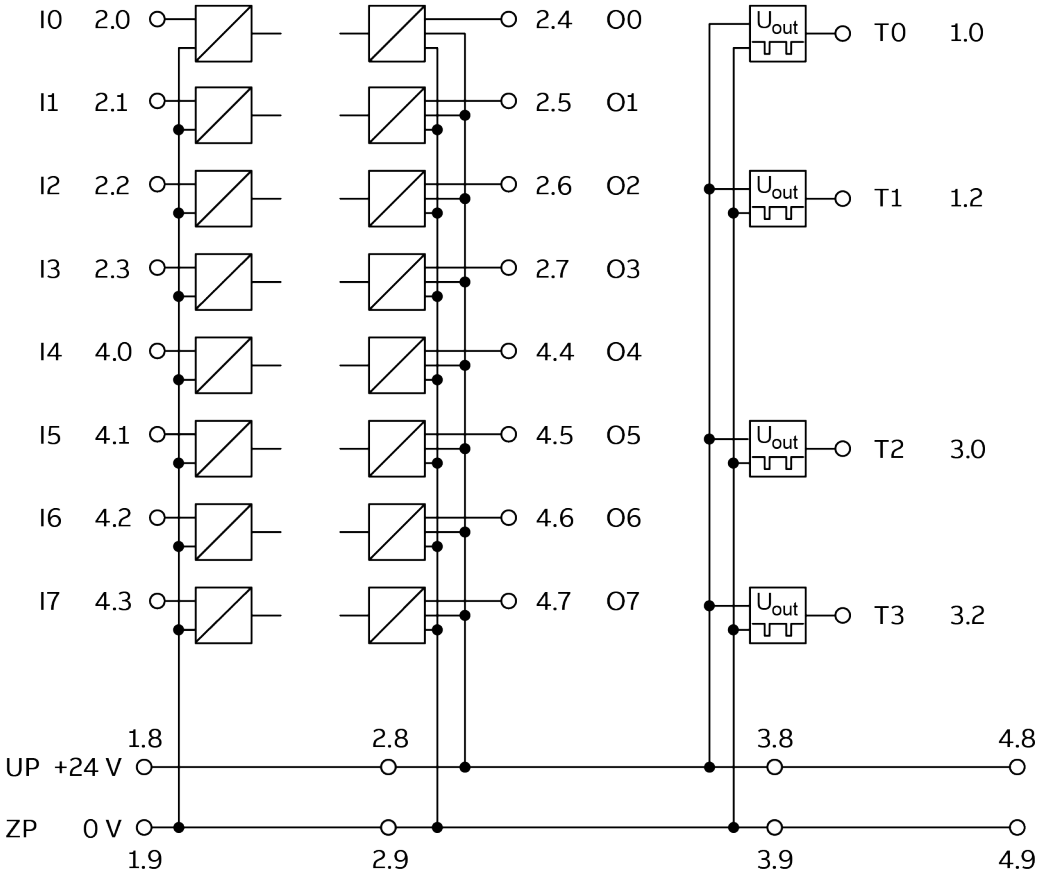
1 I/O bus
2 System LED
3 Allocation of terminal number and signal name
4 8 yellow/red LEDs to display the signal states of the digital inputs I0 to I7
5 4 Test pulse outputs T0 to T3
6 8 yellow/red LEDs to display the signal states of the digital outputs O0 to O7
7 2 rotary switches for setting the PROFIsafe address
8 1 green LED to display the state of the process supply voltage UP
9 2 red LEDs to display errors
10 Label
11 Terminal unit TU582-S(-XC)
❄ Sign for XC version

74.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

74.4.2 Inputs/Outputs



Example input

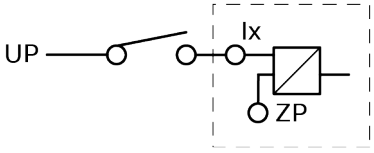


Fig. 122: Example of connection input Ix

Example output

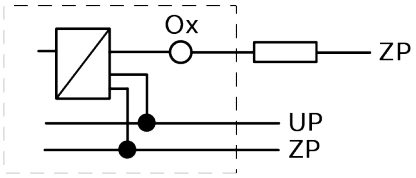


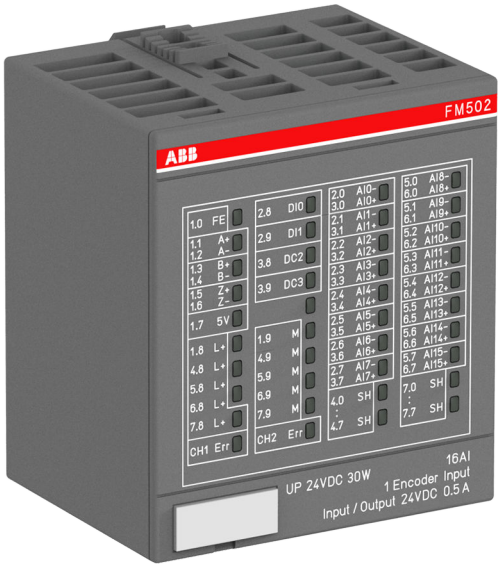
Fig. 123: Example of connection output Ox

AC500-S safety user manual

For a detailed description of the connection of the module, please refer to the "AC500-S safety user manual".

75 FM502-CMS(-XC)

- FM502-CMS
- FM502-CMS-XC



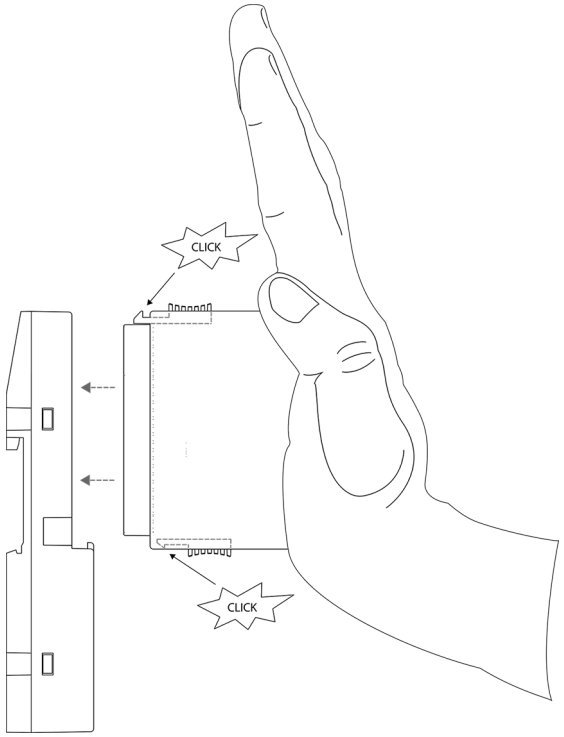
CAUTION!

Risk of injury and damaging the product!

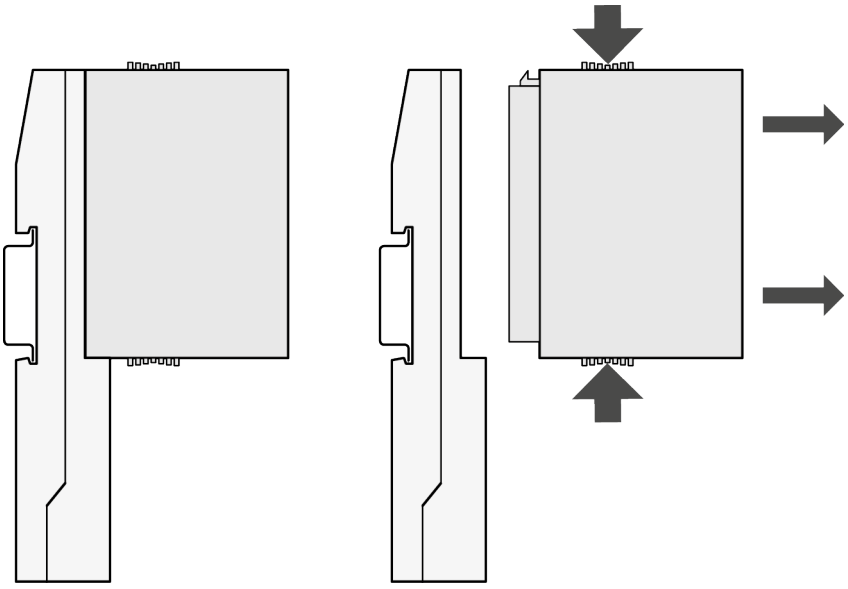
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

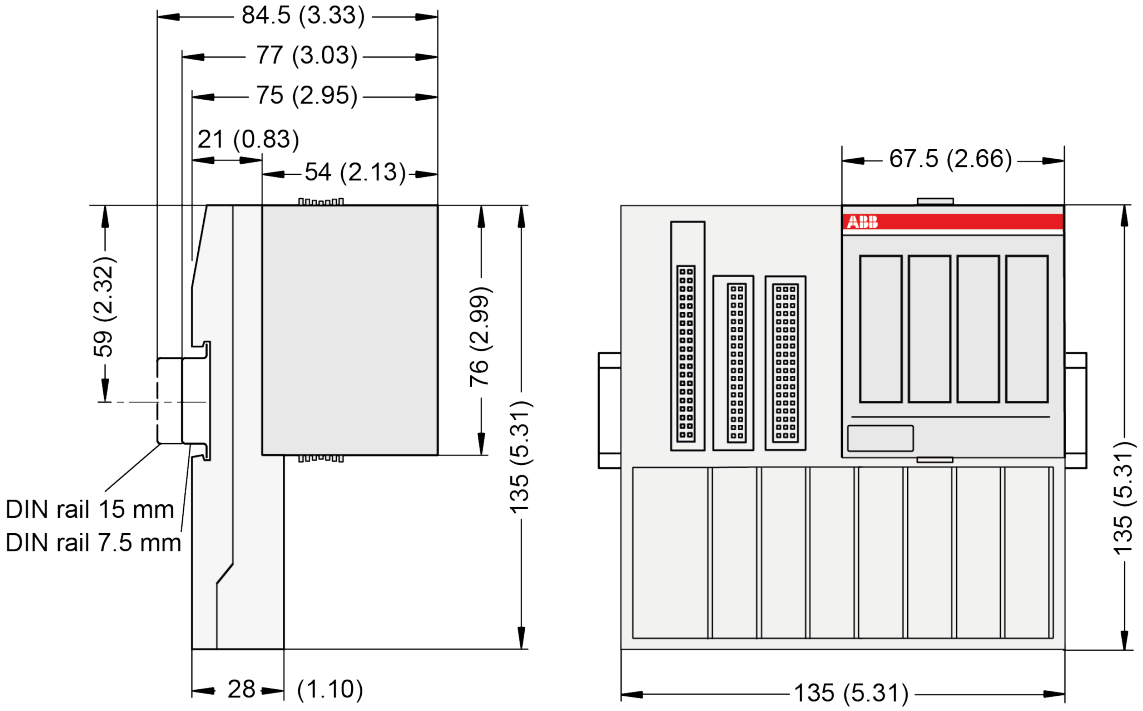
75.1 Assembly



75.2 Disassembly

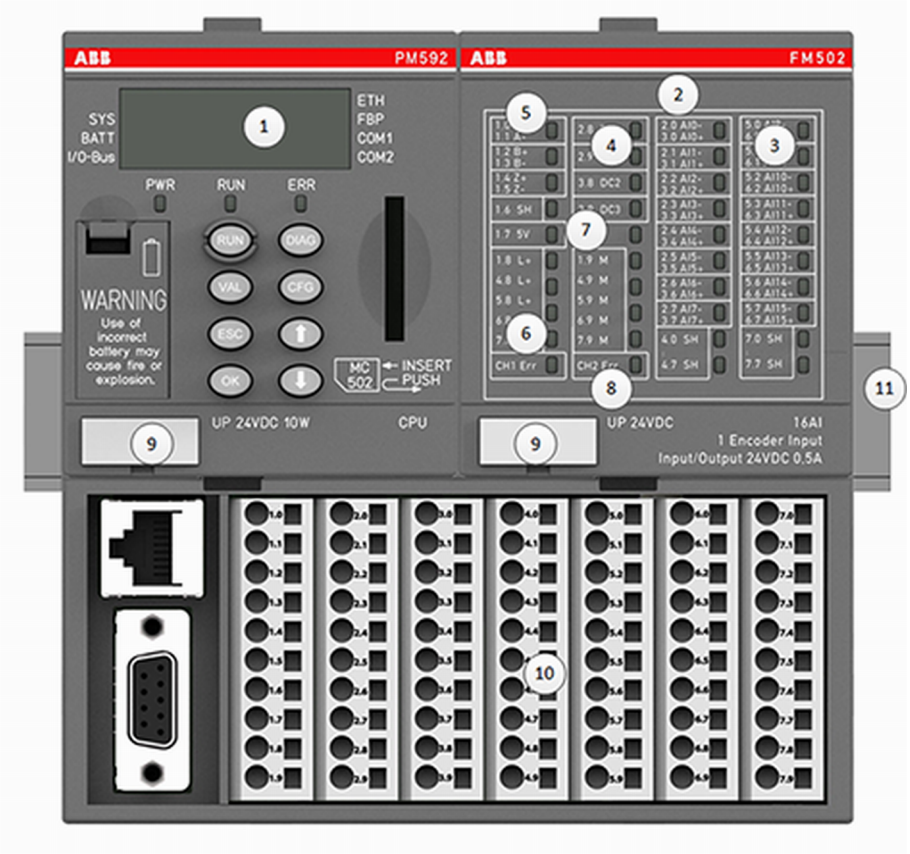


75.3 Dimensions



The dimensions are in mm and in brackets in inch.

75.4 Connections



1 Processor module PM592-ETH
2 Allocation between terminal no. and signal name
3 16 green/red LEDs to display the signal states at the analog inputs A0 ... A15
4 4 yellow LEDs to display digital inputs DI0, DI1 and digital inputs/outputs DC2,DC3
5 3 yellow LEDs display encoder/counter inputs
6 1 green LED to display the state of the process supply voltage L+
7 1 green LED to display the state of 5 V supply voltage for encoder
8 2 red LEDs to display errors
9 Label
10 Function module terminal base
11 DIN rail
❄ Sign for XC version

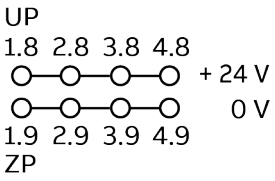
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

Table 10: Function module terminal base - pin assignment

1.0 FE	2.0 AI0-	3.0 AI0+	4.0 SH	5.0 AI8-	6.0 AI8+	7.0 SH
1.1 A+	2.1 AI1-	3.1 AI1+	4.1 SH	5.1 AI9-	6.1 AI9+	7.1 SH
1.2 A-	2.2 AI2-	3.2 AI2+	4.2 SH	5.2 AI10-	6.2 AI10+	7.2 SH
1.3 B+	2.3 AI3-	3.3 AI3+	4.3 SH	5.3 AI11-	6.3 AI11+	7.3 SH
1.4 B-	2.4 AI4-	3.4 AI4+	4.4 SH	5.4 AI12-	6.4 AI12+	7.4 SH
1.5 Z+	2.5 AI5-	3.5 AI5+	4.5 SH	5.5 AI13-	6.5 AI13+	7.5 SH

1.6 Z-	2.6 AI6-	3.6 AI6+	4.6 SH	5.6 AI14-	6.6 AI14+	7.6 SH
1.7 5V	2.7 AI7-	3.7 AI7+	4.7 SH	5.7 AI15-	6.7 AI15+	7.7 SH
1.8 L+	2.8 DI0	3.8 DC2	4.8 L+	5.8 L+	6.8 L+	7.8 L+
1.9 M	2.9 DI1	3.9 DC3	4.9 M	5.9 M	6.9 M	7.9 M

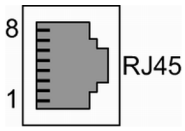
75.4.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

75.4.2 Ethernet network interface

Pin assignment



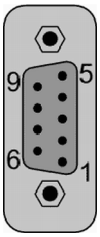
PIN	Signal	Description
1	TxD+	Transmit data +
2	TxD-	Transmit data -
3	RxD+	Receive data +
4	NC	Not connected
5	NC	Not connected
6	RxD-	Receive data -
7	NC	Not connected
8	NC	Not connected
Shield	Cable shield	Functional earth

NOTICE!
Risk of corrosion!
Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

75.4.3 Serial interface COM

Pin assignment

Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

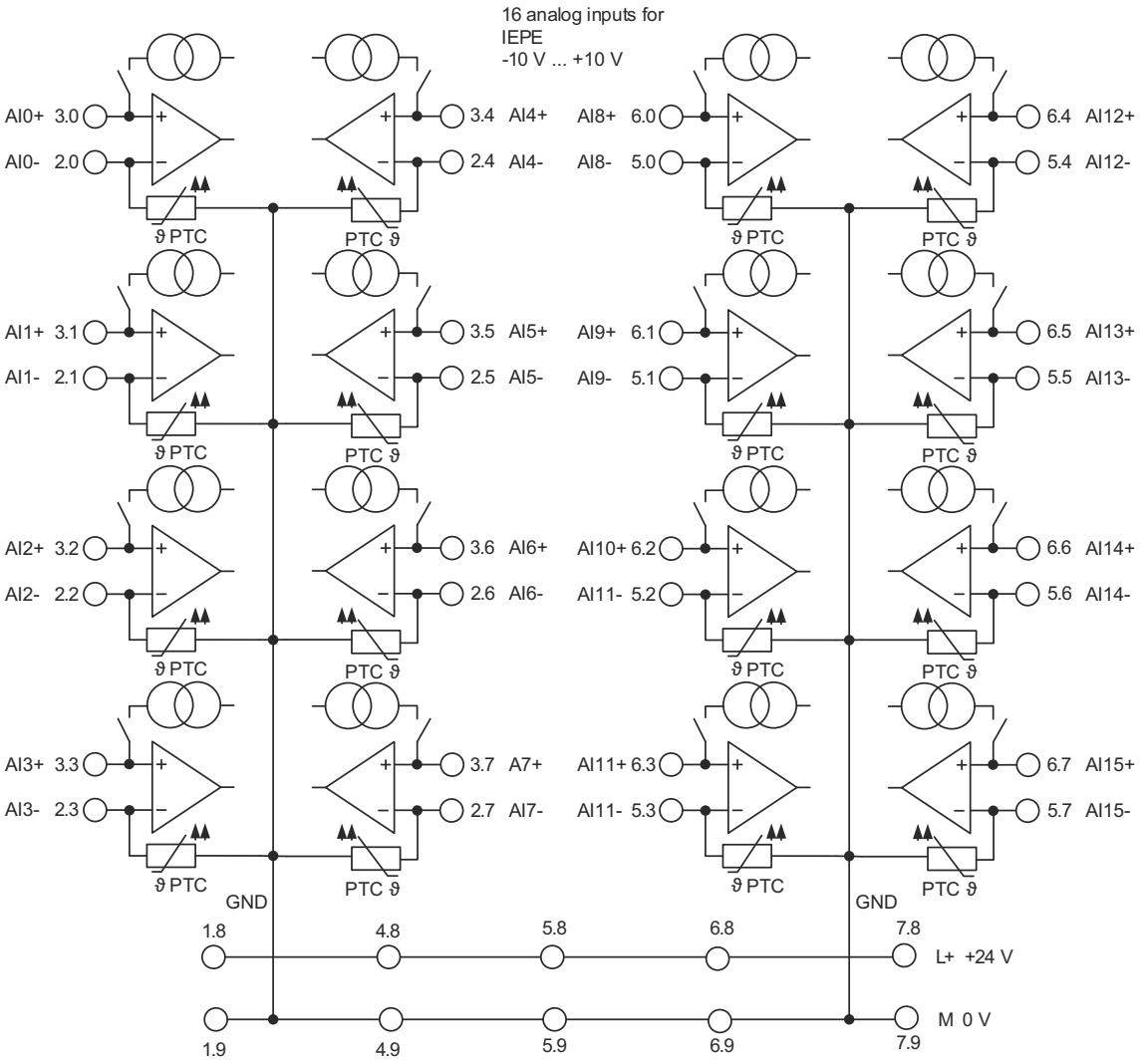
NOTICE!

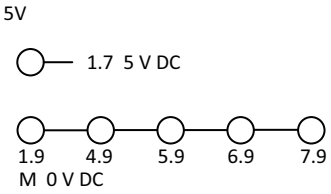
Risk of corrosion!

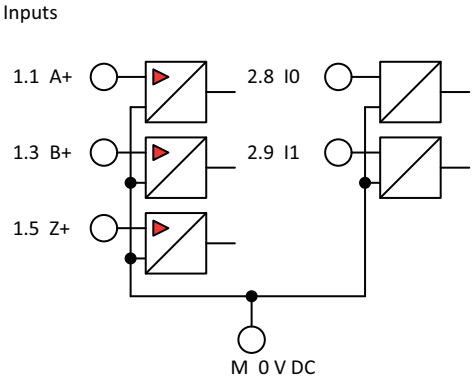
Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

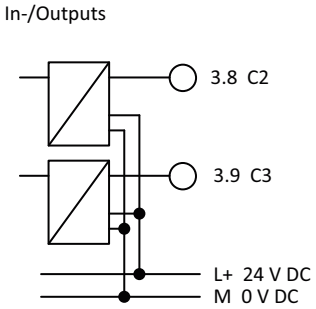
Protect unused connectors and slots with TA535 protective caps for XC devices.

75.4.4 Inputs/Outputs




5V
1.7 5 V DC
1.9
4.9
5.9
6.9
7.9
M 0 V DC


Inputs
1.1 A+
1.3 B+
1.5 Z+
2.8 I0
2.9 I1
M 0 V DC


In-/Outputs
3.8 C2
3.9 C3
L+ 24 V DC
M 0 V DC

76 FM562

- FM562



CAUTION!

Risk of injury and damaging the product!

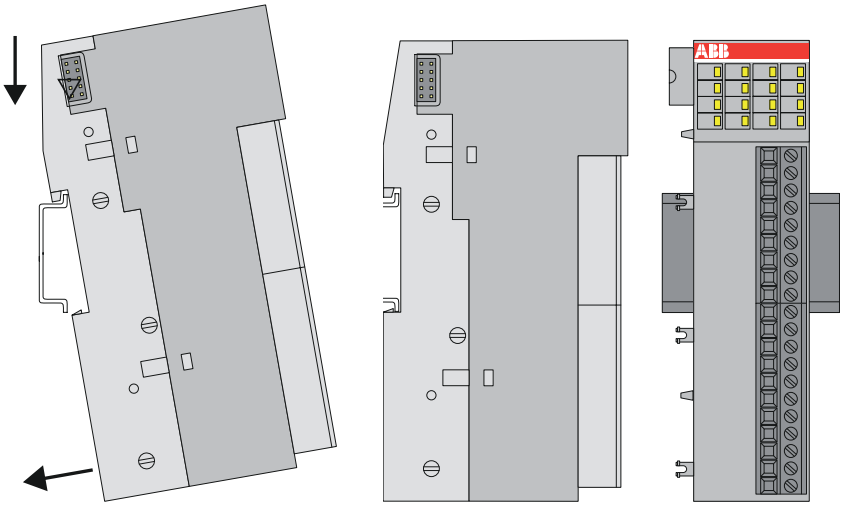
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

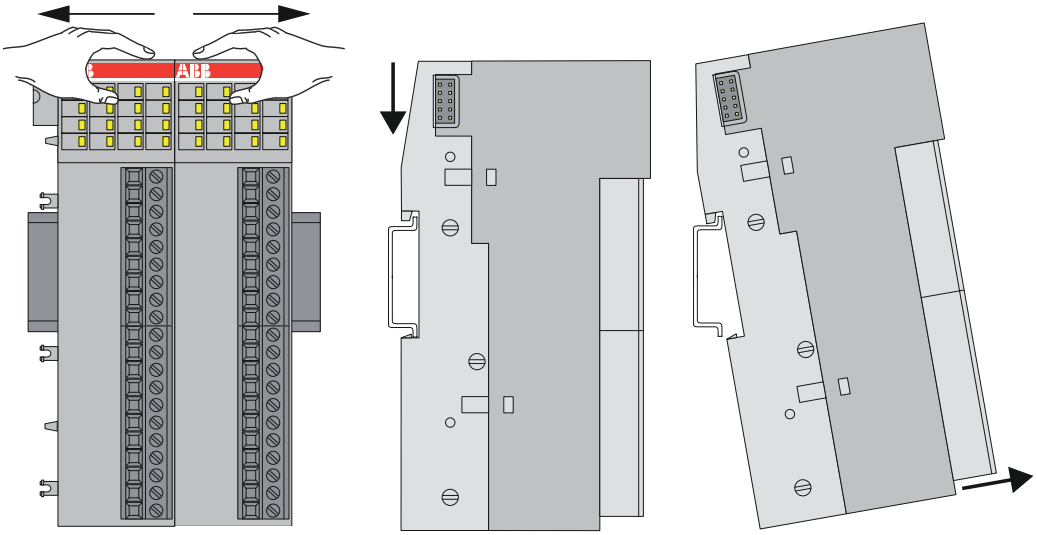
CAUTION!

This module must not be used together with the DC505-FBP/DC551- CS31/ CI51X/CI59X module.

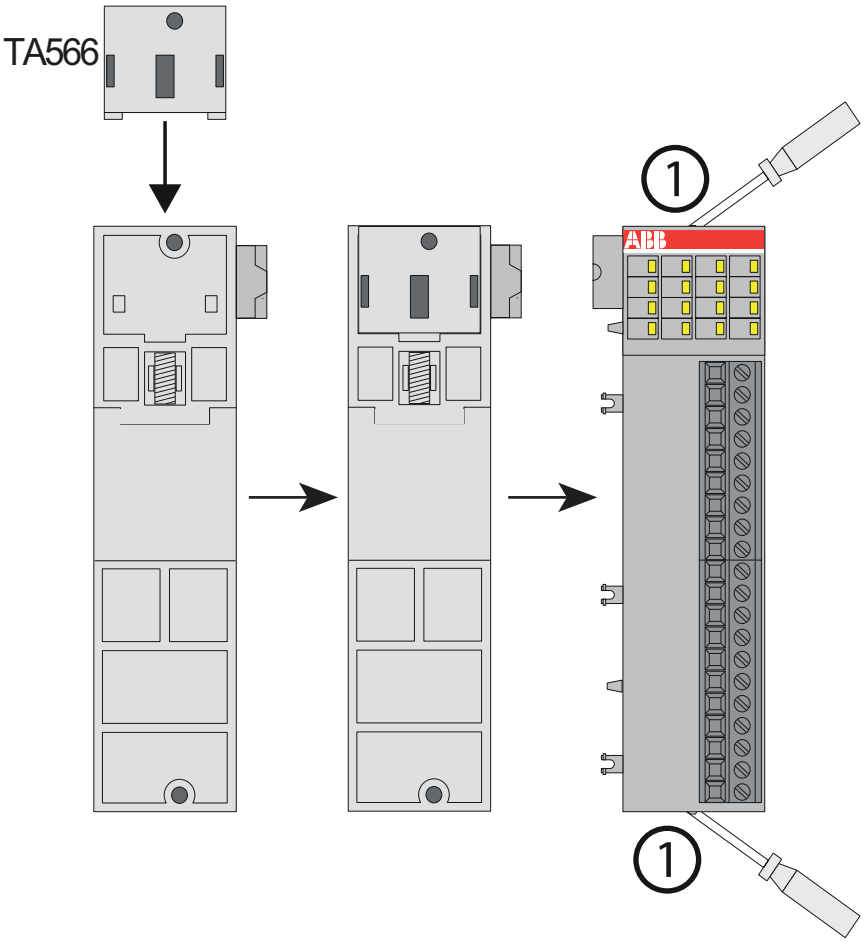
76.1 Assembly



76.2 Disassembly



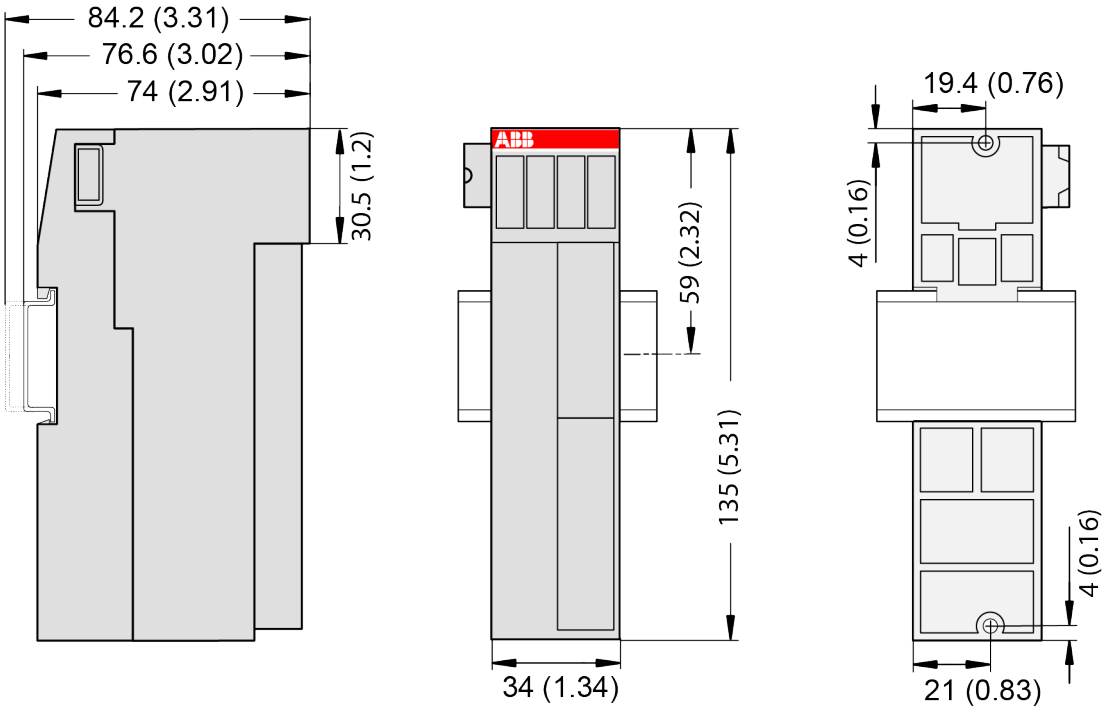
76.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

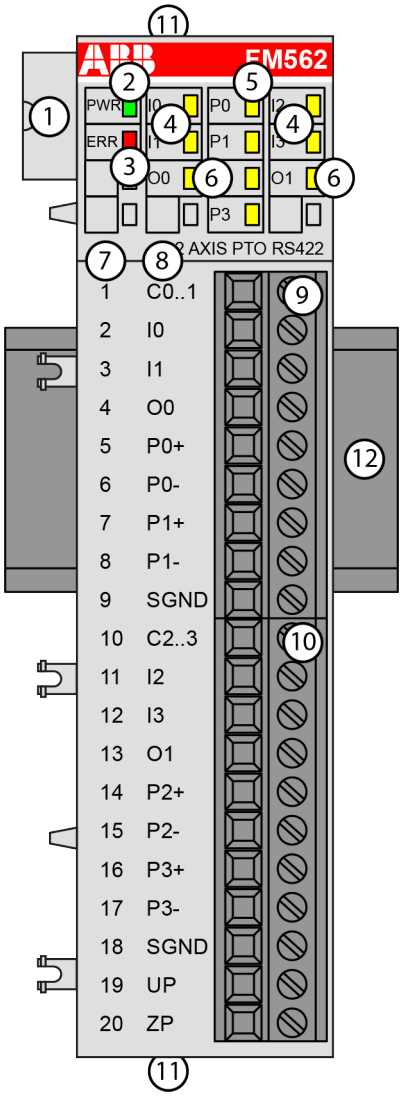
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

76.4 Dimensions



The dimensions are in mm and in brackets in inch.

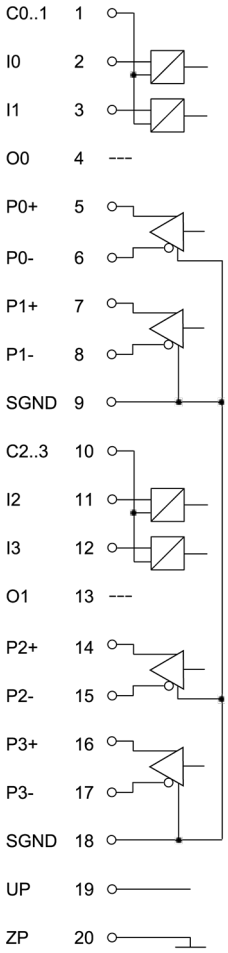
76.5 Connections



1 I/O bus
2 1 green LED to display power supply
3 1 red LED to display error
4 4 yellow LEDs to display the signal states of the inputs I0 to I3
5 4 yellow LEDs to display the signal states of the pulse train outputs P0 ... P3
6 2 yellow LEDs to display the signal states of O0 ... O1 (reserved)
7 Terminal number
8 Allocation of signal name
9 Terminal block for axis signals (9-pin)
10 Terminal block for axis signals and process supply voltage (11-pin)
11 2 holes for wall-mounting with screws
12 DIN rail

5	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front
	TA565-9	9-pin, spring, cable from front
6	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

76.5.1 Inputs/Outputs



Examples

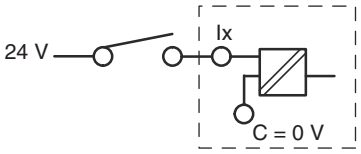


Fig. 124: FM562 used as source input

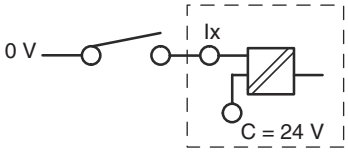


Fig. 125: FM562 used as sink input

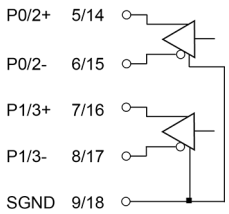
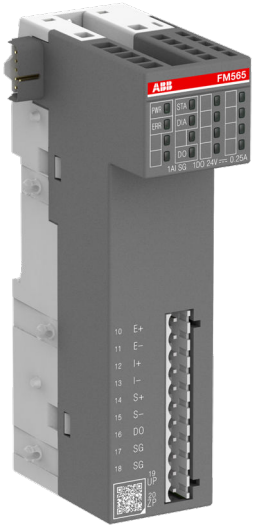


Fig. 126: Example for RS-422 differential output Px

77 FM565

- FM565



CAUTION!

Risk of injury and damaging the product!

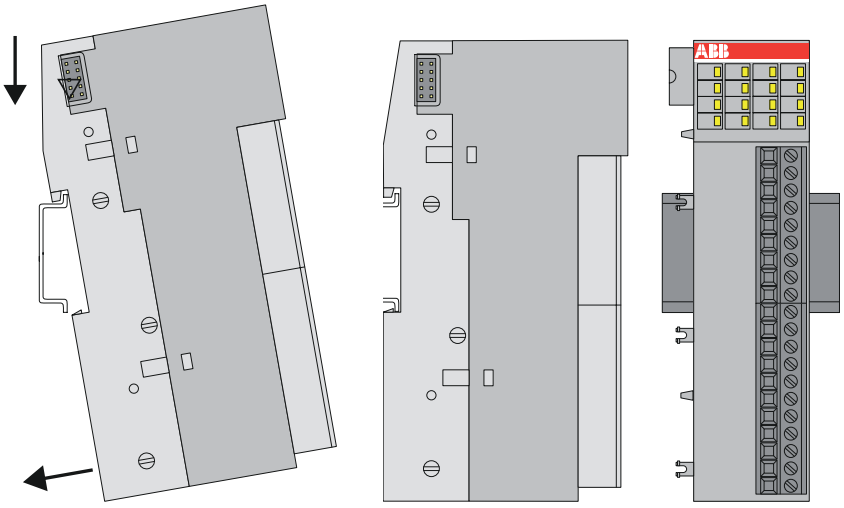
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

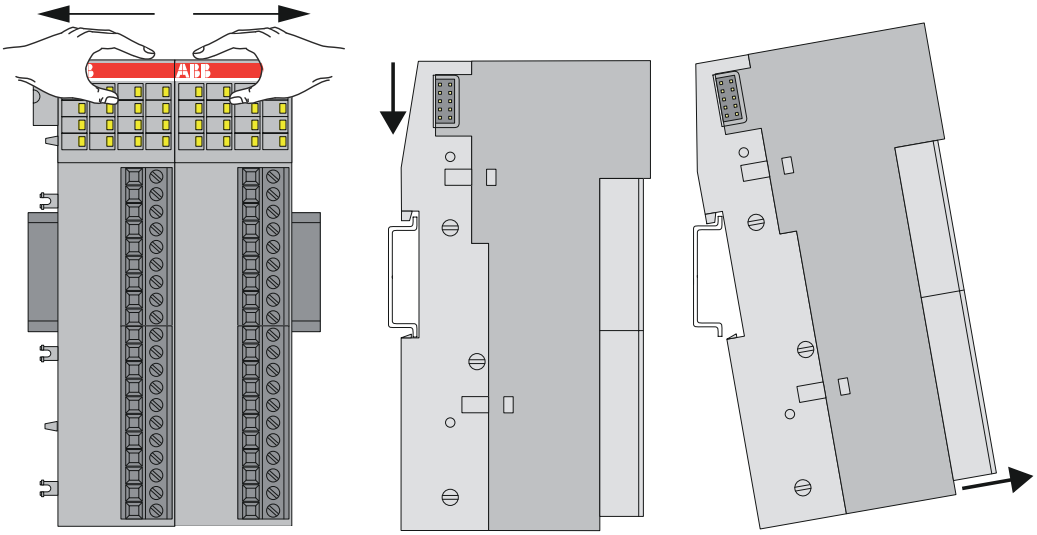
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

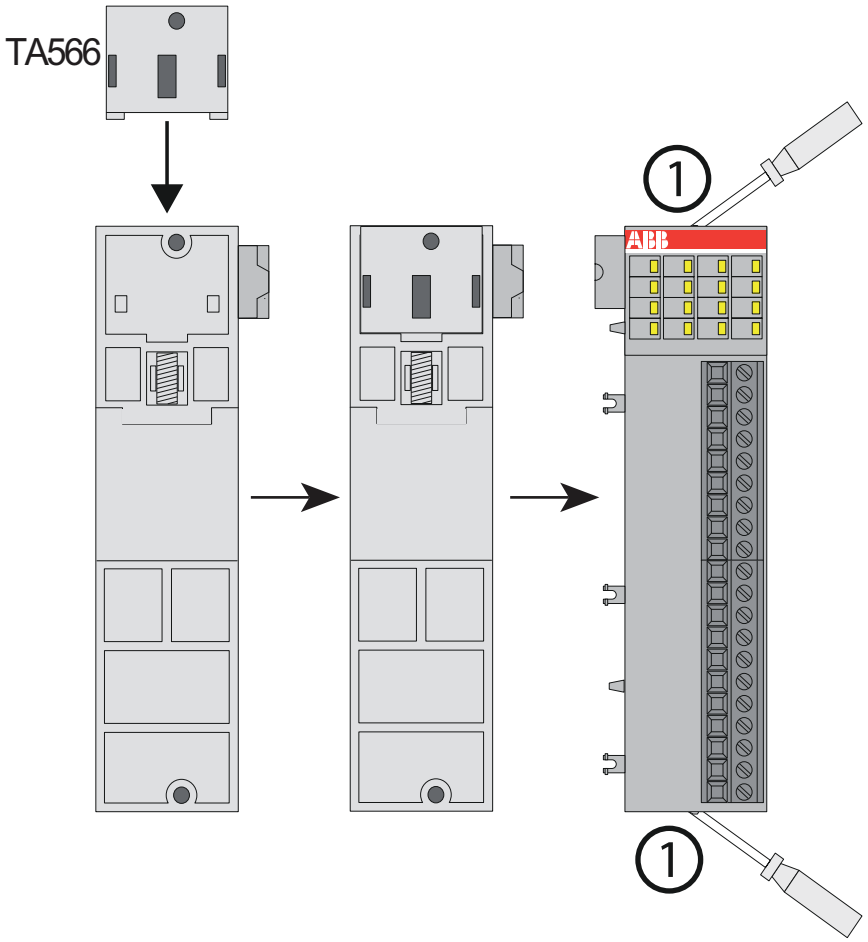
77.1 Assembly



77.2 Disassembly



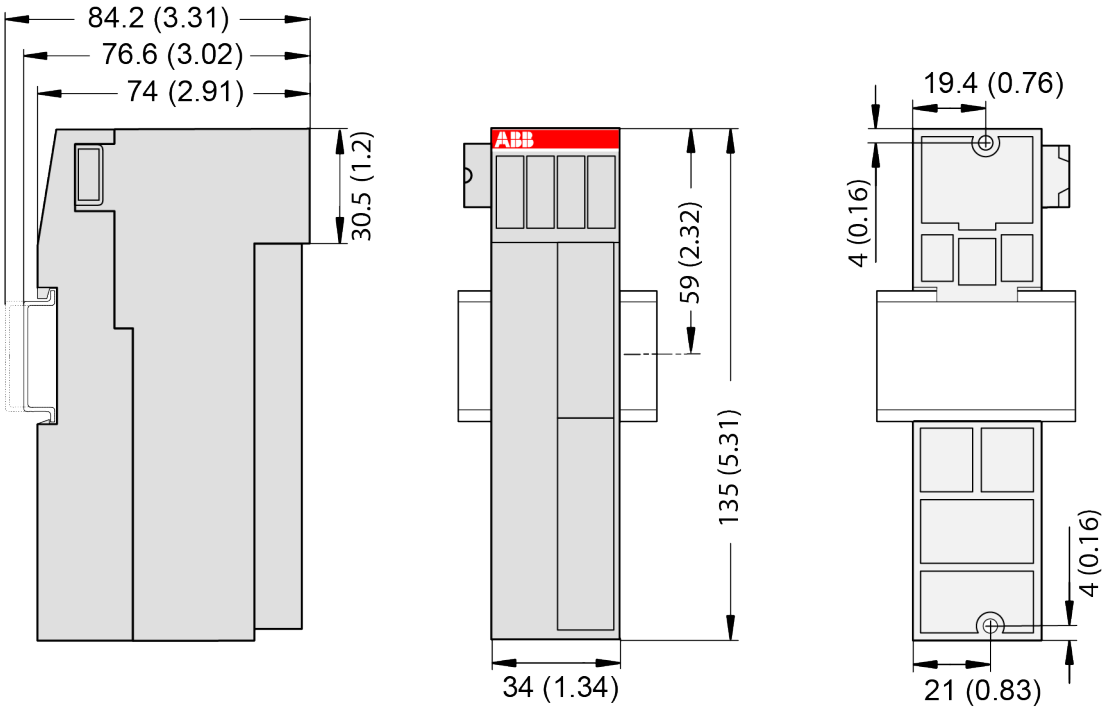
77.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

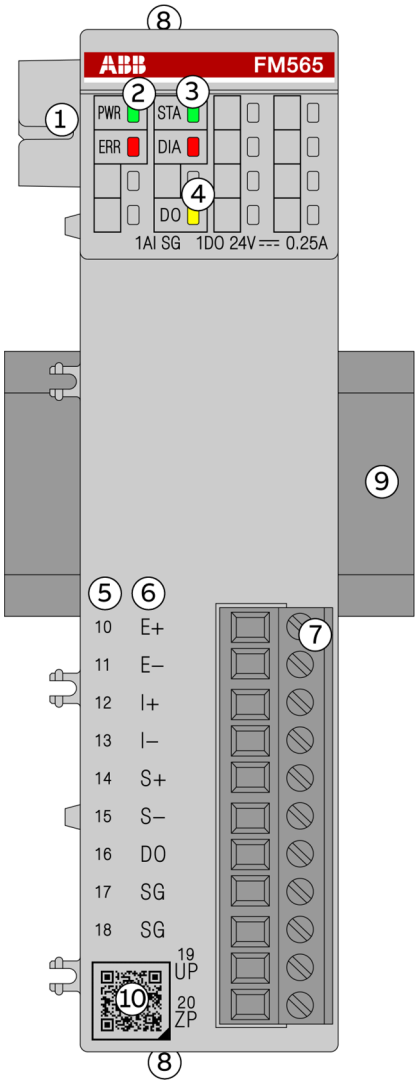
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

77.4 Dimensions



The dimensions are in mm and in brackets in inch.

77.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 1 green LED to display the state of input channel, 1 red LED to display the diagnosis of input channel
4 1 yellow LED to display the state of output channel
5 Terminal number
6 Allocation of signal name
7 Terminal block for SG channel signals (11-pin)
8 2 holes for wall-mounting with screws
9 DIN rail
10 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

7	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

77.5.1 Inputs/Outputs

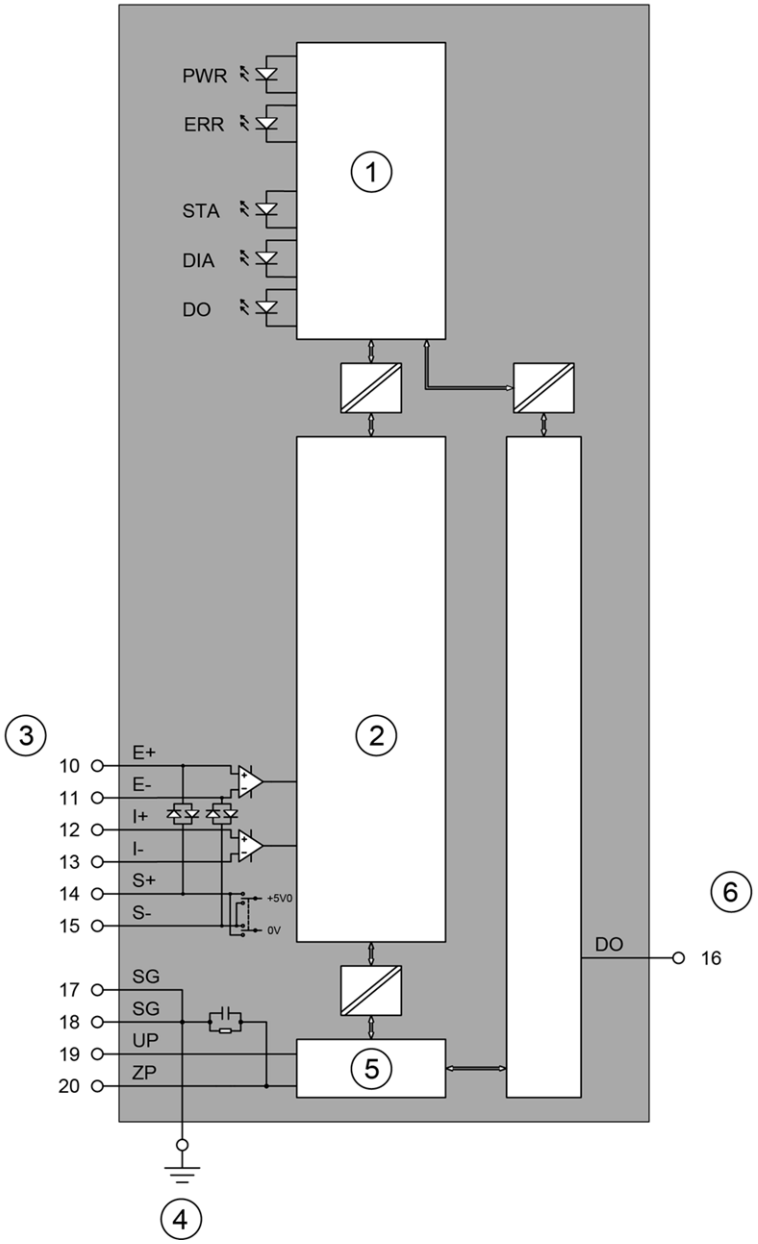
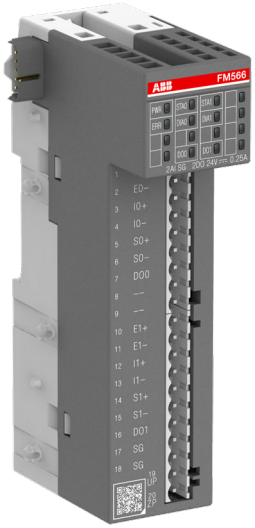


Fig. 127: Internal construction of the analog inputs and digital outputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog input
4 Functional earth connection
5 Fly-back DC/DC power supply
6 Digital output

78 FM566

- FM566



CAUTION!

Risk of injury and damaging the product!

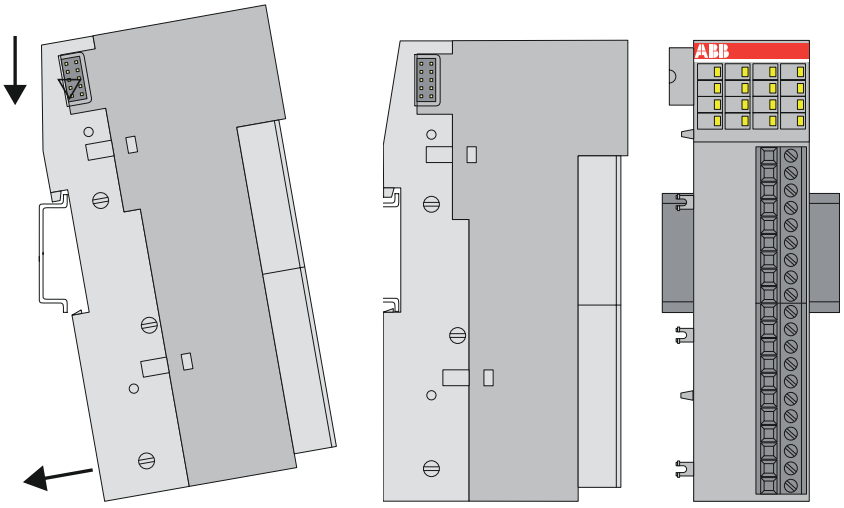
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

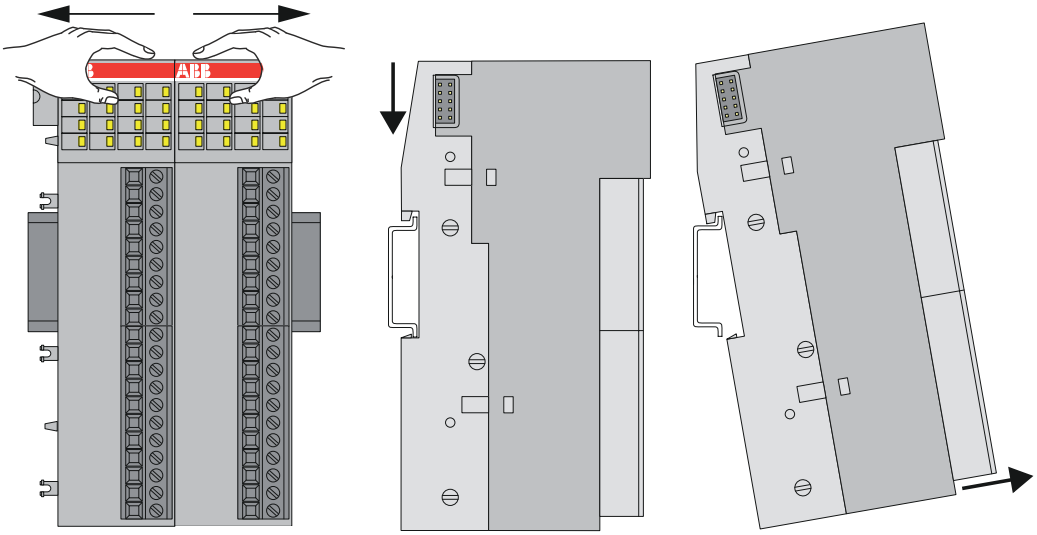
CAUTION!

Do not use this module together with the DC505-FBP/CI590-CS31-HA module.

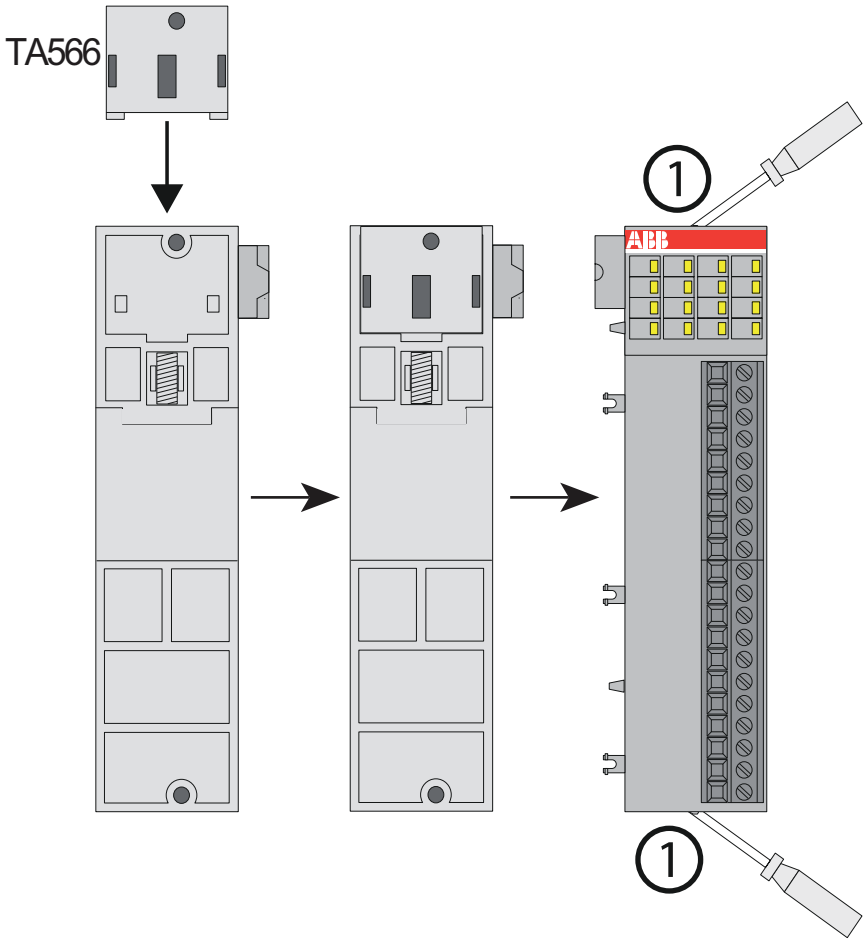
78.1 Assembly



78.2 Disassembly



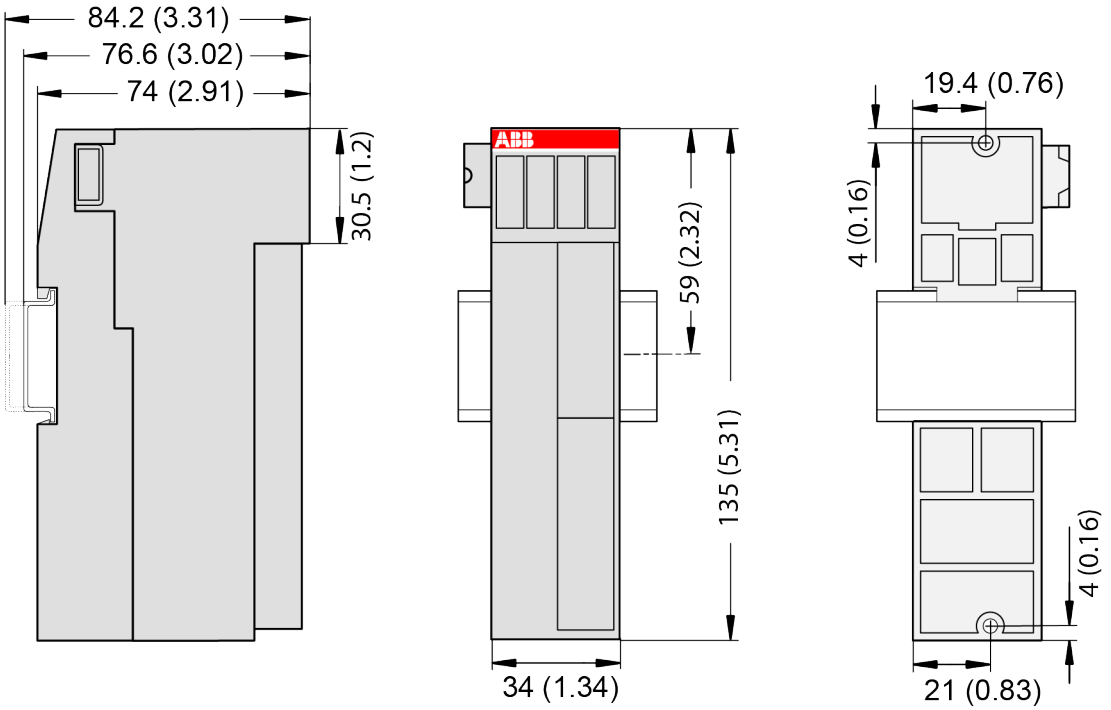
78.3 Assembly with screws



1 Fasten the module with two screws (max. diameter 4 mm)

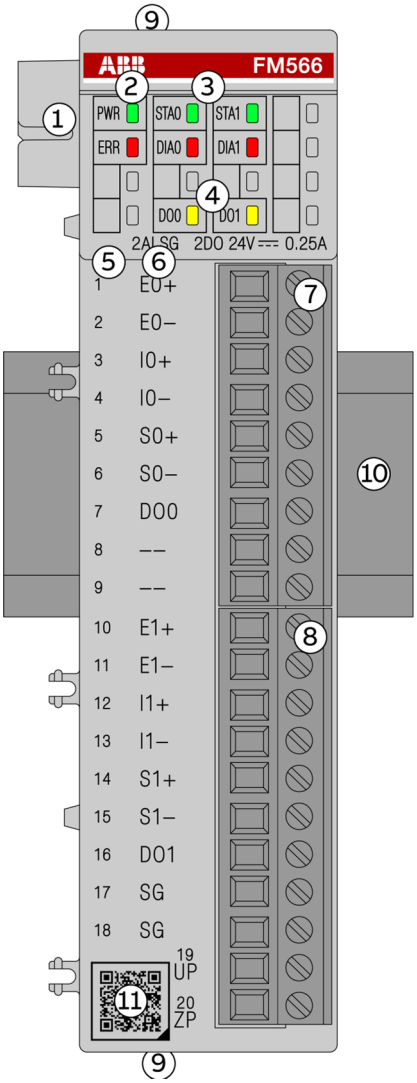
NOTICE!
The insertion of the accessories TA566 for wall mounting is essential.

78.4 Dimensions



The dimensions are in mm and in brackets in inch.

78.5 Connections



1 I/O bus
2 1 green LED to display power supply, 1 red LED to display error
3 2 green LEDs to display the state of 2 input channels, 2 red LEDs to display the diagnosis of 2 input channels
4 2 yellow LEDs to display the state of 2 output channels
5 Terminal number
6 Allocation of signal name
7 Terminal block for SG channel signals (9-pin)
8 Terminal block for SG channel signals (11-pin)
9 2 holes for wall-mounting with screws
10 DIN rail
11 QR code for datasheet

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

7	TA563-9	9-pin, screw, cable from side
	TA564-9	9-pin, screw, cable from front

	TA565-9	9-pin, spring, cable from front
8	TA563-11	11-pin, screw, cable from side
	TA564-11	11-pin, screw, cable from front
	TA565-11	11-pin, spring, cable from front

78.5.1 Inputs/Outputs

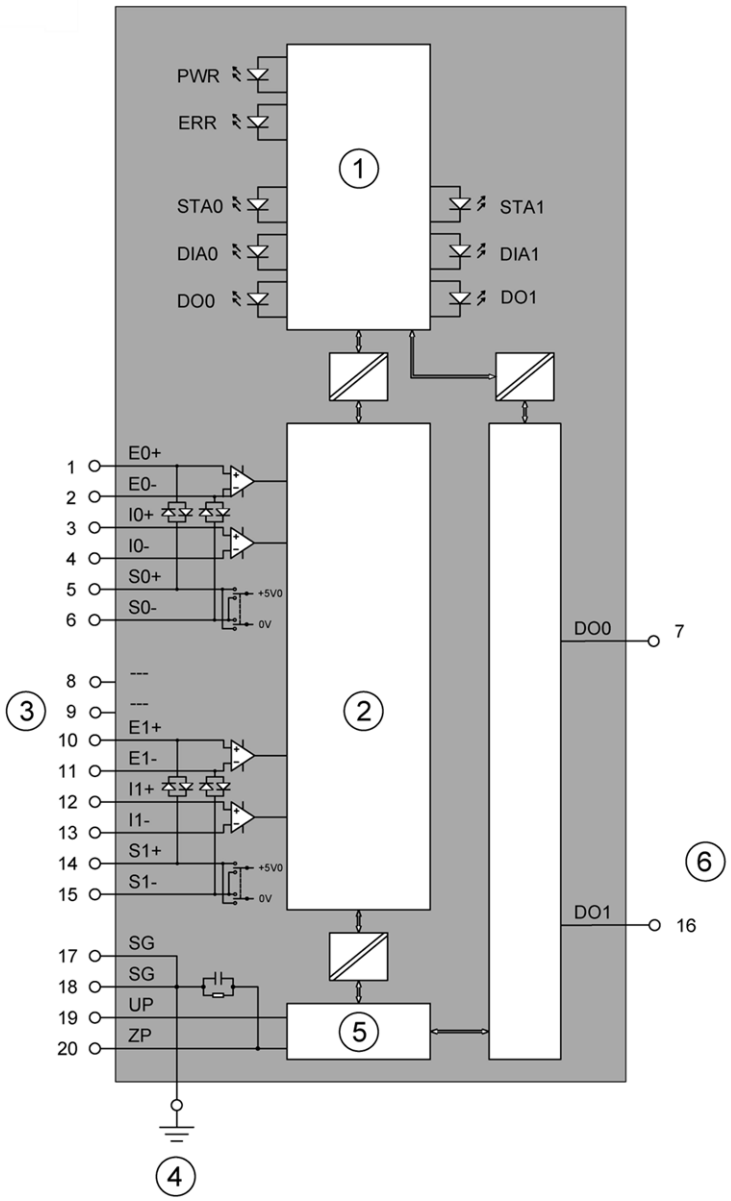
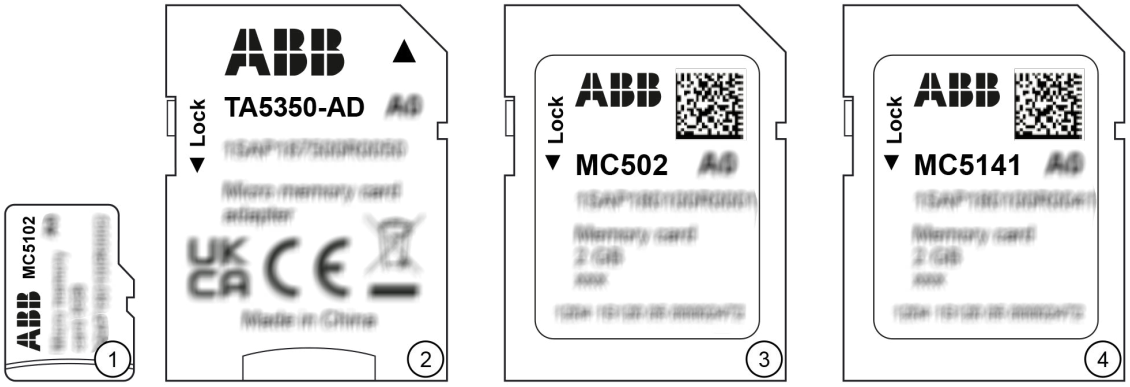


Fig. 128: Internal construction of the analog inputs and digital outputs

1 I/O bus interface and MCU core circuit
2 ADC and logic circuit
3 Analog inputs
4 Functional earth connection
5 Fly-back DC/DC power supply
6 Digital outputs

79 MC5xx(x) - Memory card

- MC502 memory card
- MC5141 memory card
- MC5102 micro memory card with TA5350-AD micro memory card adapter



1 MC5102 micro memory card
2 TA5350-AD micro memory card adapter
3 MC502 memory card
4 MC5141 memory card

The use of other memory cards than MC502, MC5141 and MC5102 is prohibited.

ABB is not responsible nor liable for consequences resulting from use of unapproved memory cards.

Memory card type	AC500 V2	AC500-XC V2	AC500 V3	AC500-XC V3	AC500-eCo V3
MC5141	x	x	x	x	-
MC5102 **with** TA5350-AD micro memory card adapter	x [1])	x [1]) [2])	x	x [2])	-
MC5102 **without** TA5350-AD micro memory card adapter	-	-	-	-	x

[1]) As of firmware 2.5.x

[2]) Temporary use of MC5102 is possible under normal environmental conditions, but MC5141 should be preferred.

CAUTION!

Risk of injury and damaging the product!

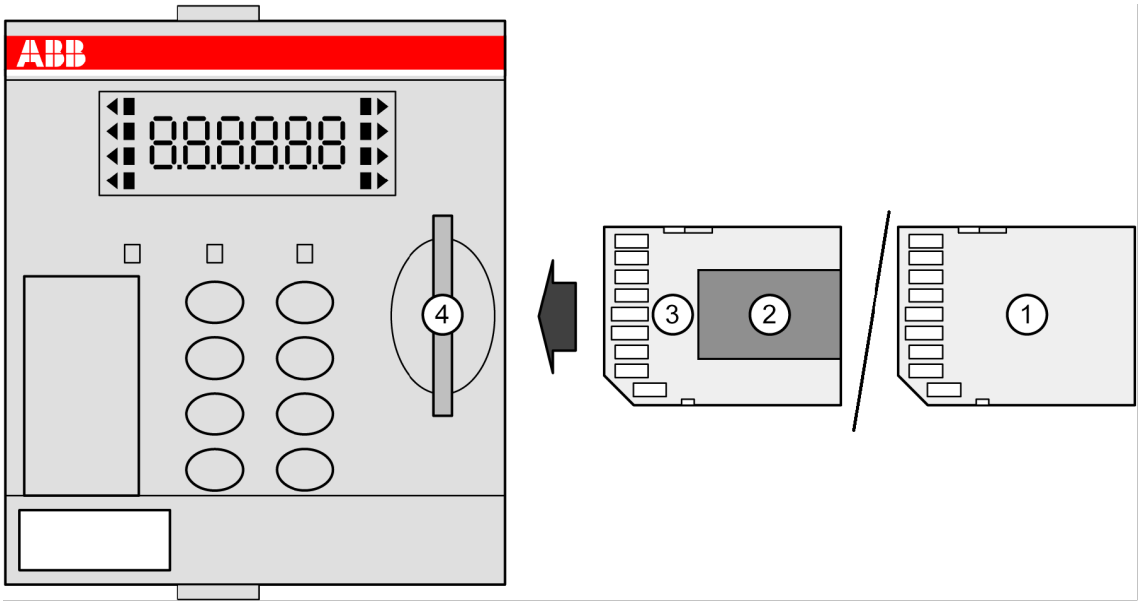
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

79.1 Assembly

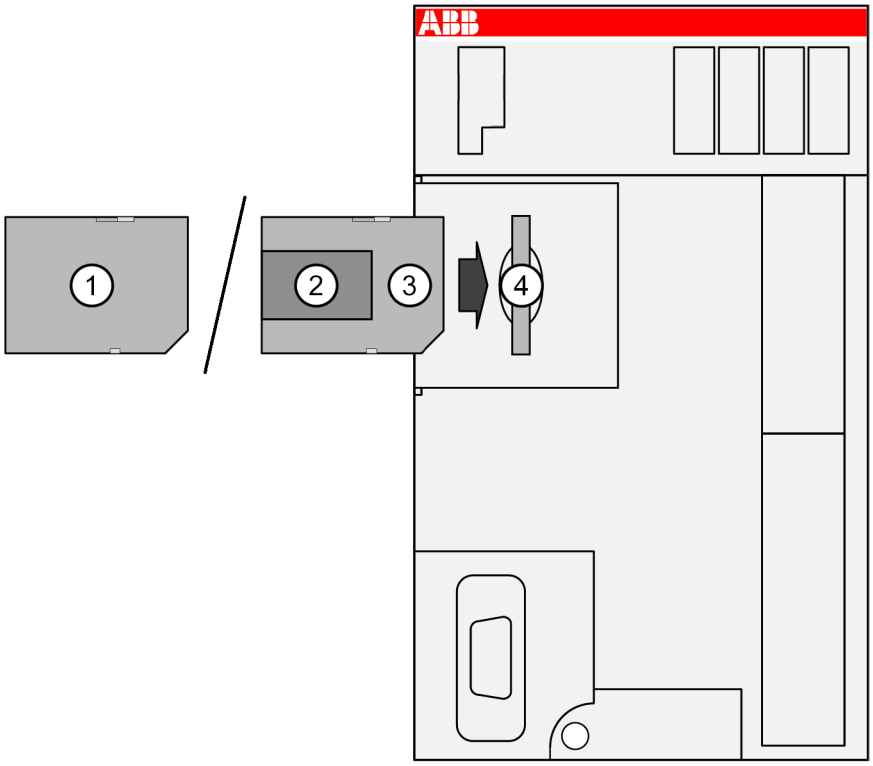
▷ Insert the memory card into the memory card slot of the processor module until locked.

AC500



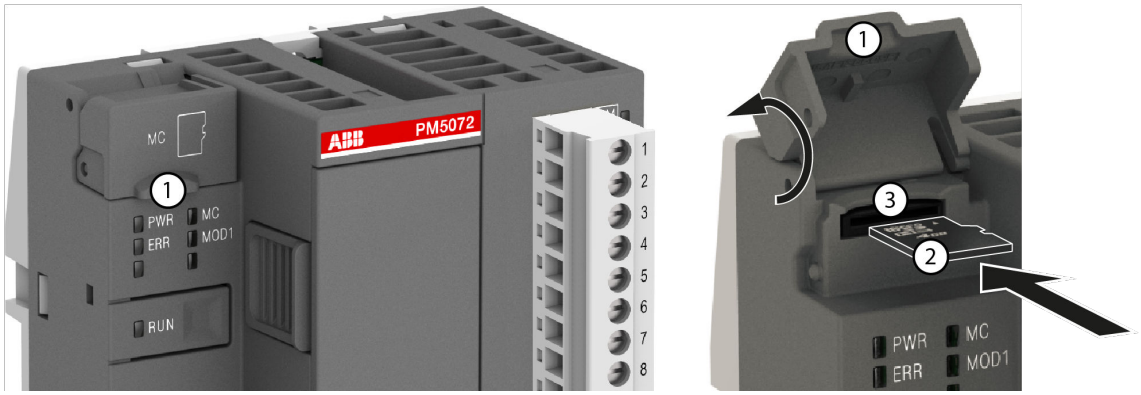
1 MC502 or MC5141 memory card
2 MC5102 micro memory card
3 TA5350-AD micro memory card adapter
4 Memory card slot

AC500-eCo V2



1 MC502 or MC5141 memory card
2 MC5102 micro memory card
3 TA5350-AD micro memory card adapter
4 MC503 memory card adapter

AC500-eCo



1 Micro memory card slot cover
2 Micro memory card
3 Micro memory card slot

1. Open the micro memory card slot cover by turning it upwards.
2. Carefully insert the micro memory card into the micro memory card slot as far as it will go. Observe orientation of card.
3. Close the micro memory card slot cover by turning it downwards.

79.2 Disassembly

NOTICE!

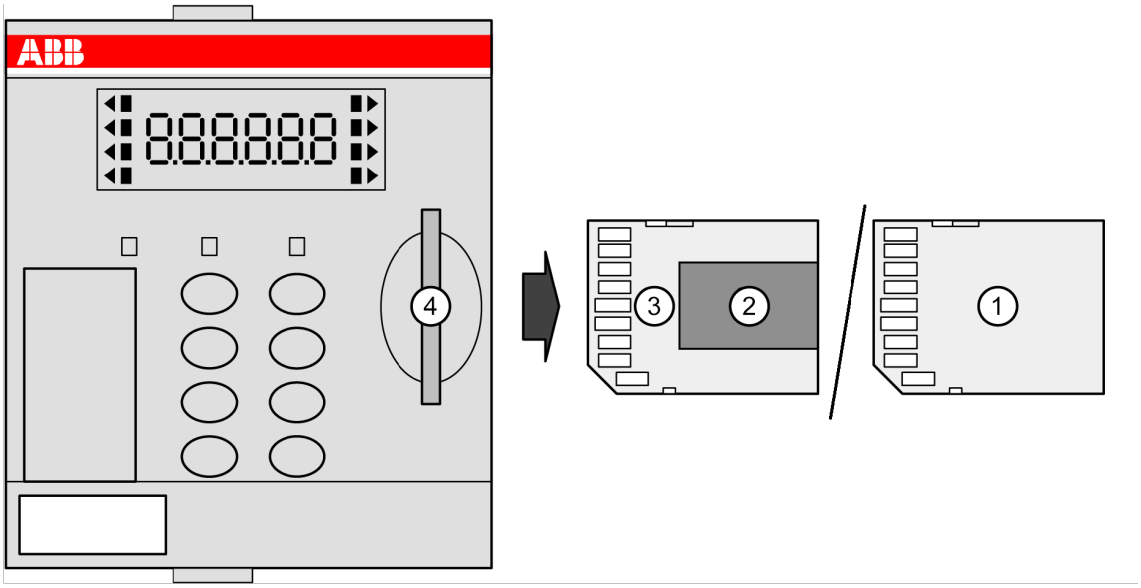
Removal of the memory card

Do not remove the memory card during access.

Otherwise the memory card and/or files on it might get corrupted and/or normal PLC operation might be disturbed.

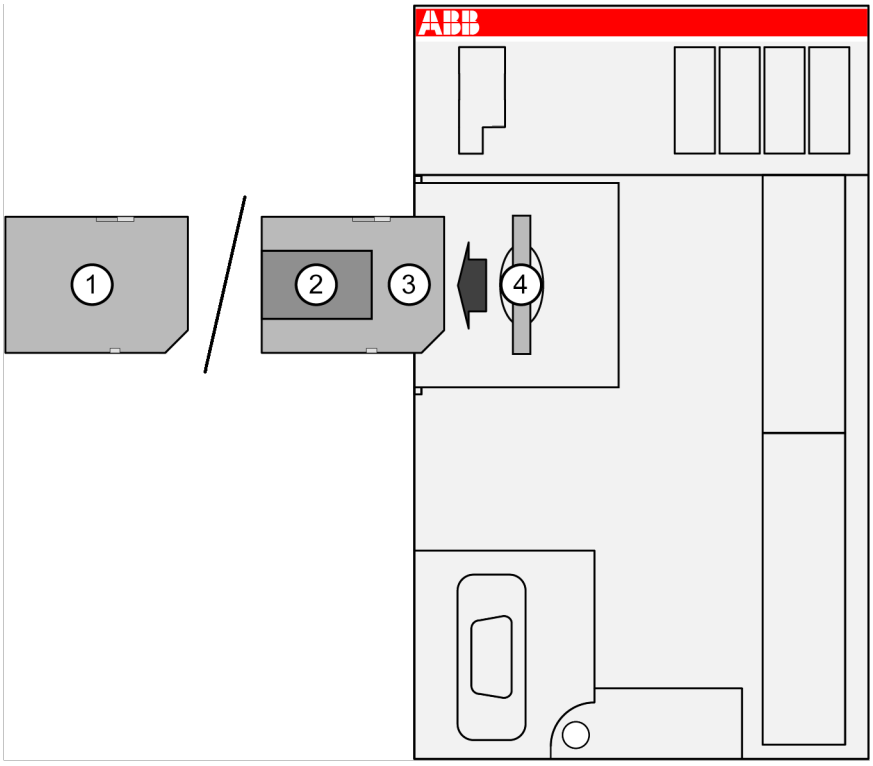
▷ To remove the memory card, push on the memory card until it moves forward. By this, the memory card is unlocked and can be removed.

AC500



1 MC502 or MC5141 memory card
2 MC5102 micro memory card
3 TA5350-AD micro memory card adapter
4 Memory card slot

AC500-eCo V2



1 MC502 or MC5141 memory card
2 MC5102 micro memory card
3 TA5350-AD micro memory card adapter
4 MC503 memory card adapter

AC500-eCo

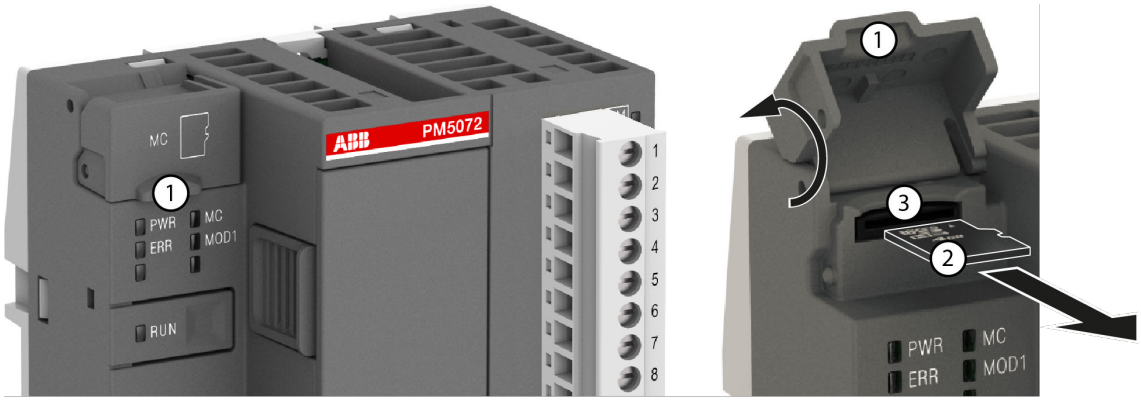
NOTICE!

Disturbed PLC operation

Do not remove the memory card when it is working!

Otherwise the memory card and/or files on it might get corrupted and/or normal PLC operation might be disturbed.

– Remove the memory card only when no black square (■) is shown next to MC in the display.

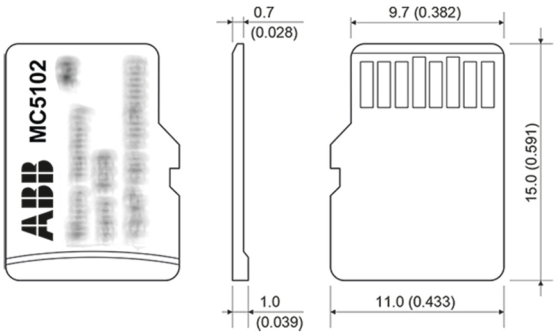


1 Micro memory card slot cover
2 Micro memory card
3 Micro memory card slot

1. Open the micro memory card slot cover by turning it upwards.
2. Micro memory card can be removed from the micro memory card slot by gripping and pulling with two fingers.
3. Close the micro memory card slot cover by turning it downwards.

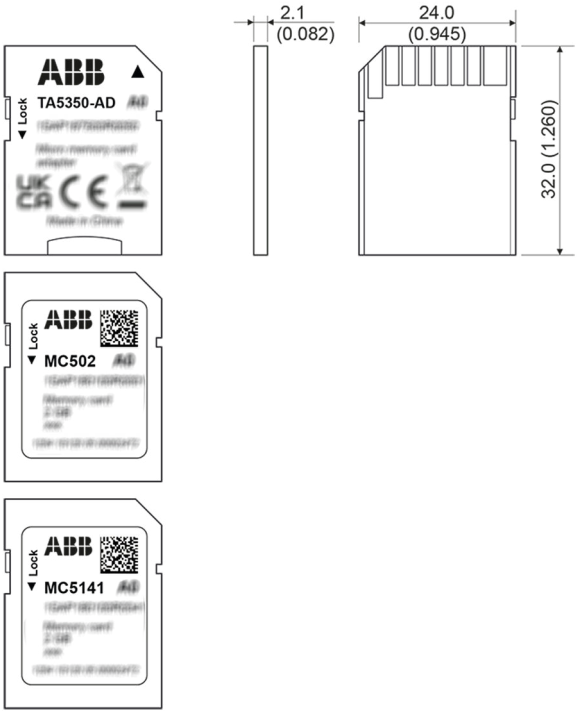
79.3 Dimensions

Micro memory card



The dimensions are in mm and in brackets in inch.

Memory card / Micro memory card adapter



The dimensions are in mm and in brackets in inch.

80 PM5012-x-ETH

- PM5012-T-ETH
- PM5012-R-ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

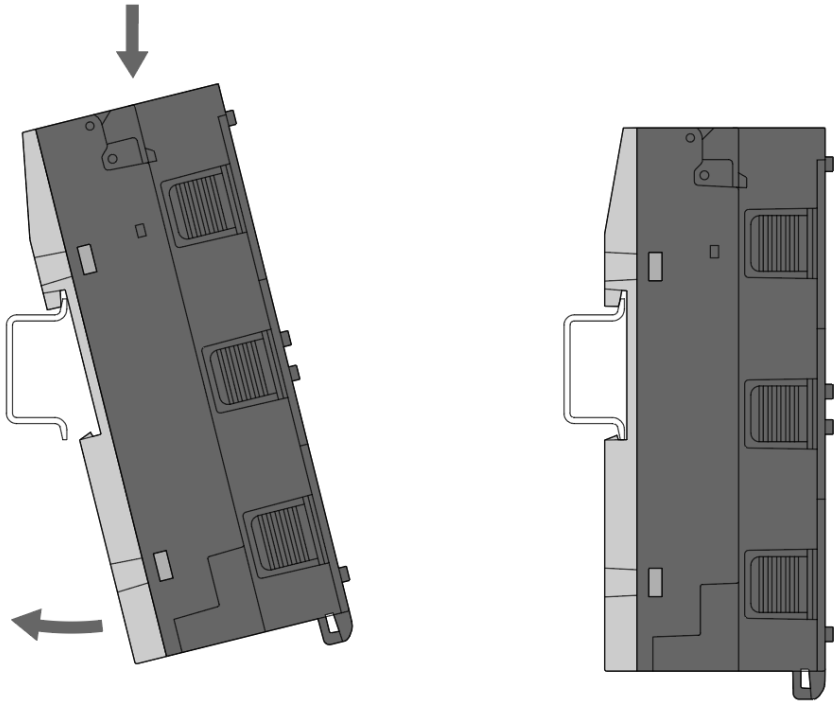
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

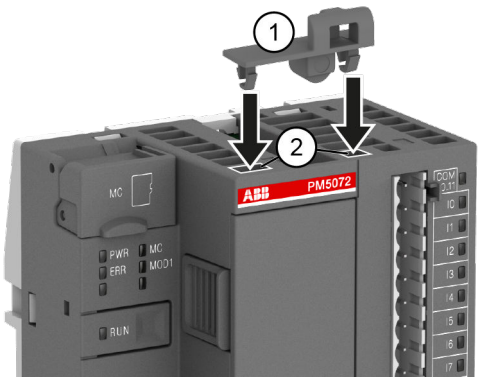
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

80.1 Assembly



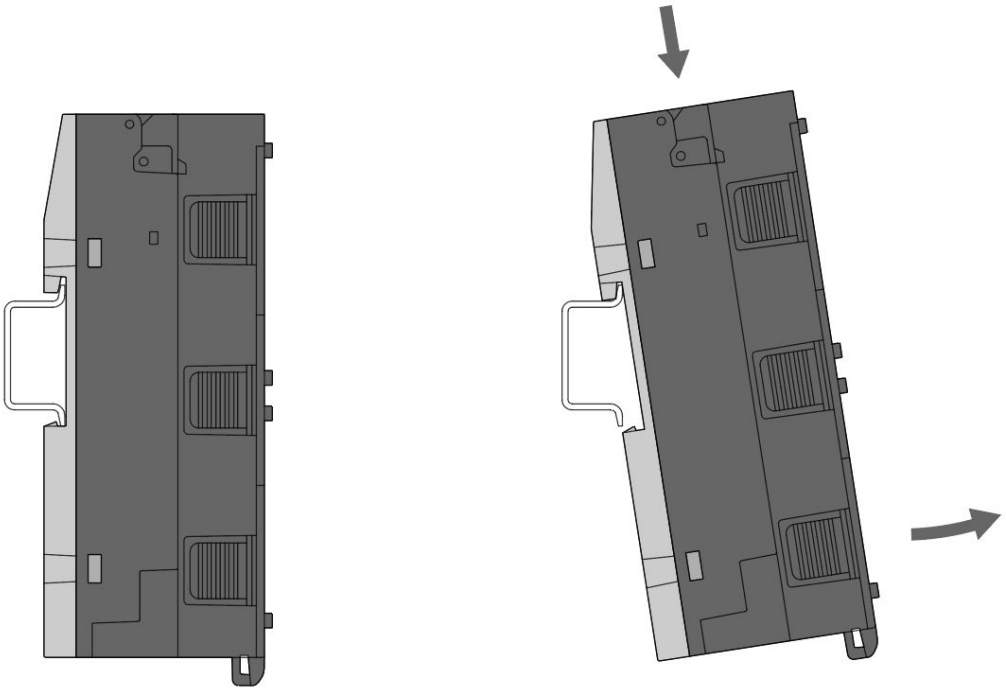
80.1.1 Assembly TA5301-CFA



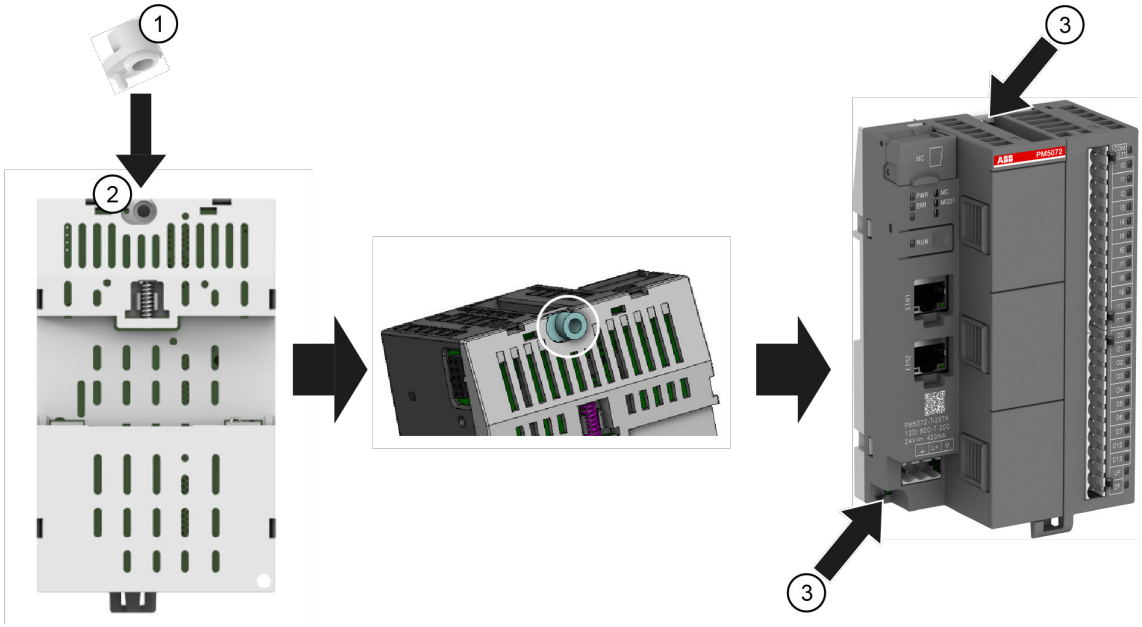
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

80.2 Disassembly



80.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

⇨

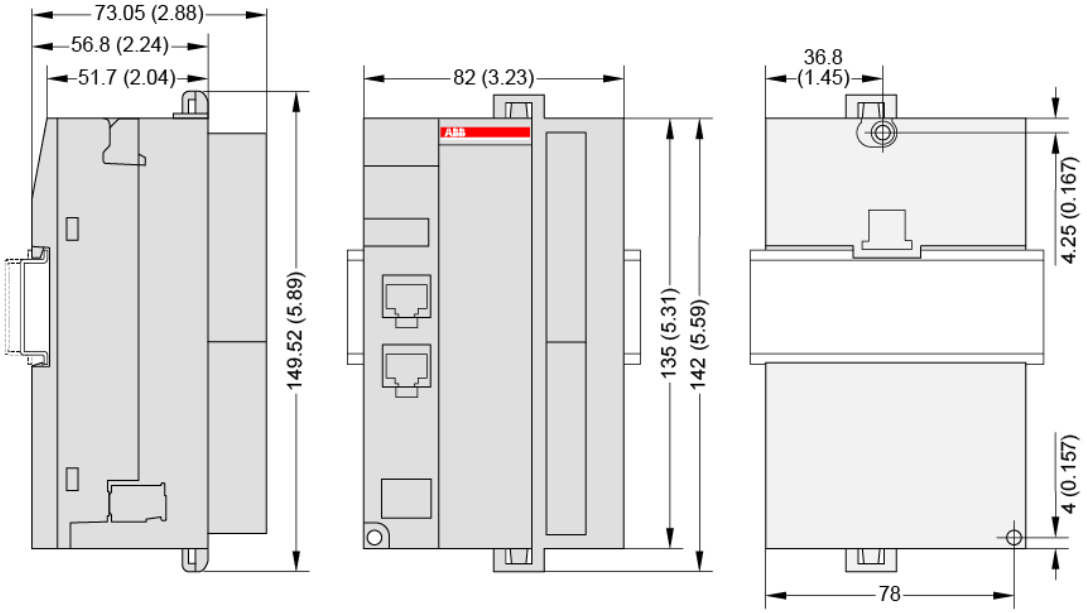
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

80.4 Dimensions



The dimensions are in mm and in brackets in inch.

80.5 Connections

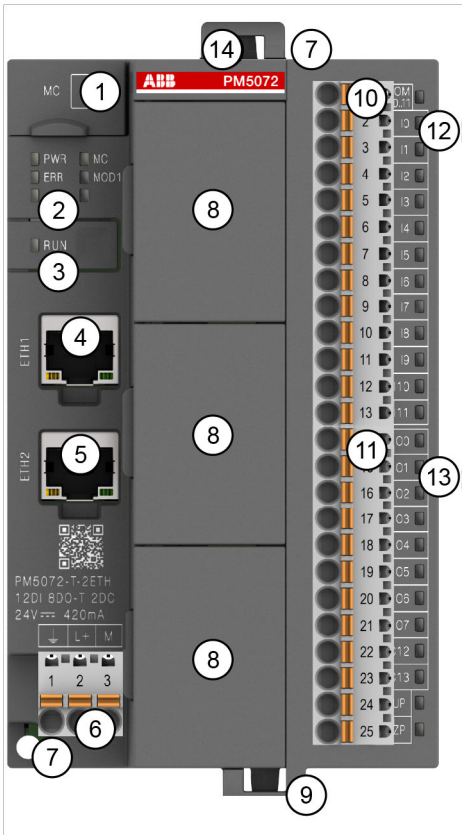


Fig. 129: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

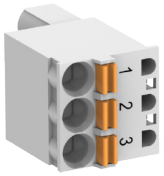
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

80.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

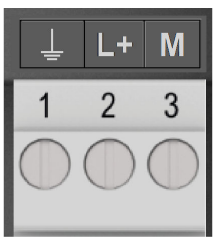
Table 11: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

Risk of damaging the PLC due to improper voltage levels!

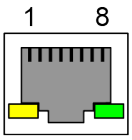
– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.

Observe the **system data** and the **technical data** of the used module.

80.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 12: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

80.5.3 Onboard I/Os

80.5.3.1 Connections

80.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

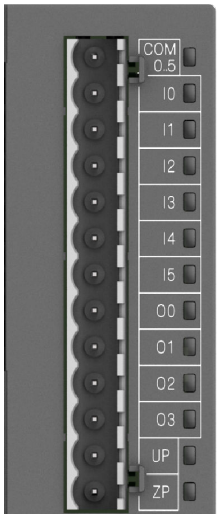


Table 13: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

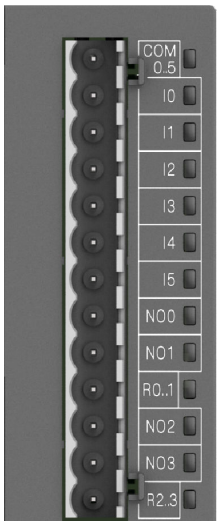


Table 14: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

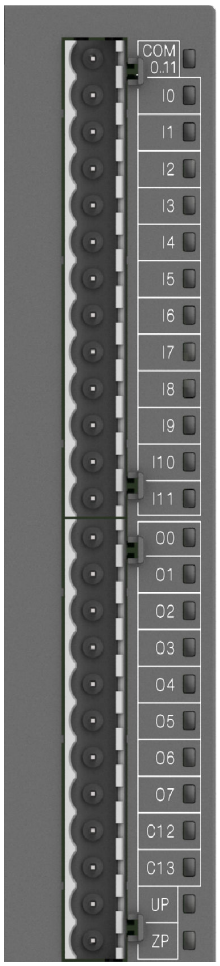


Table 15: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

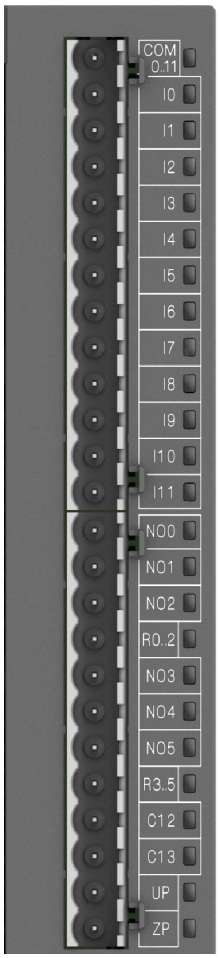


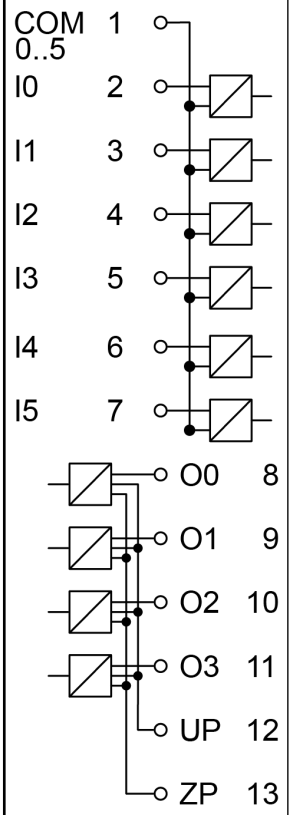
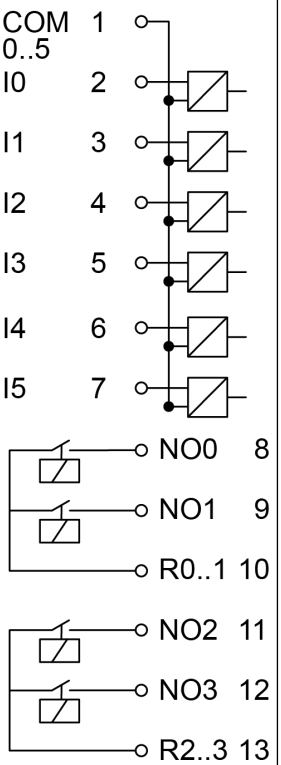
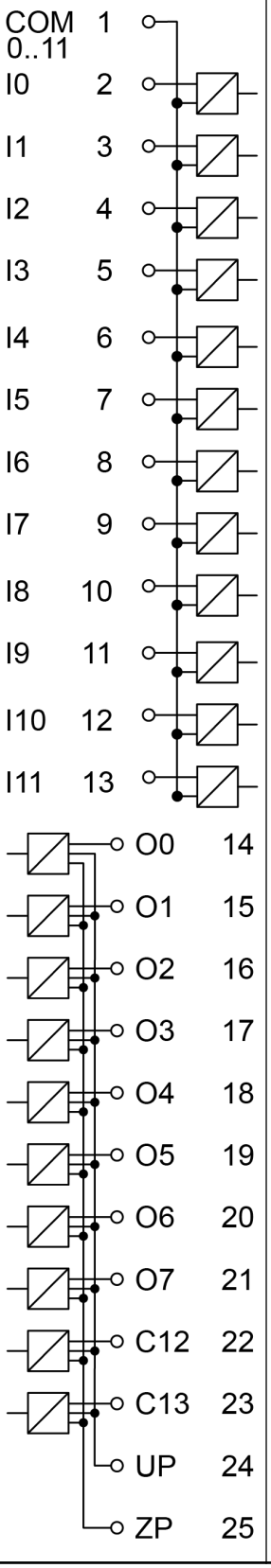
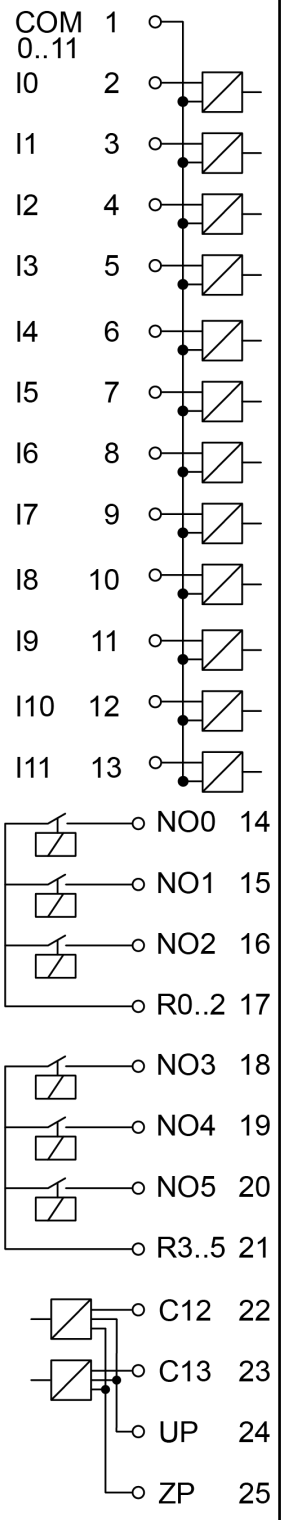
Table 16: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 17: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

80.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

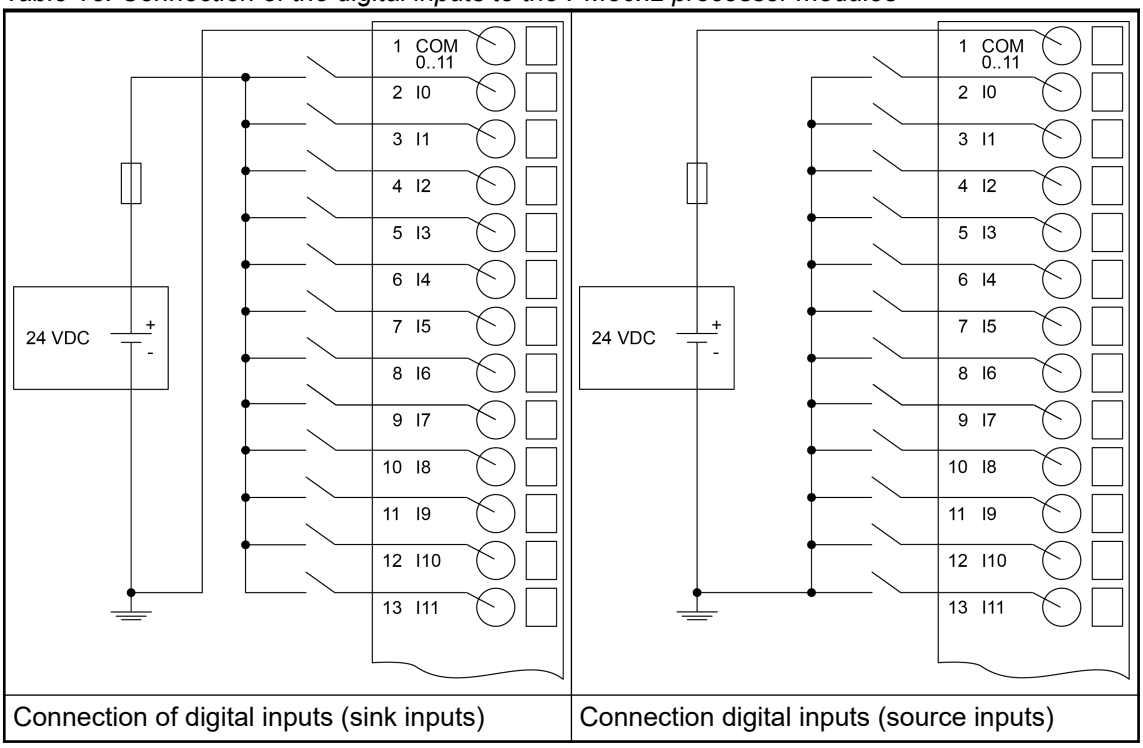
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 18: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

80.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

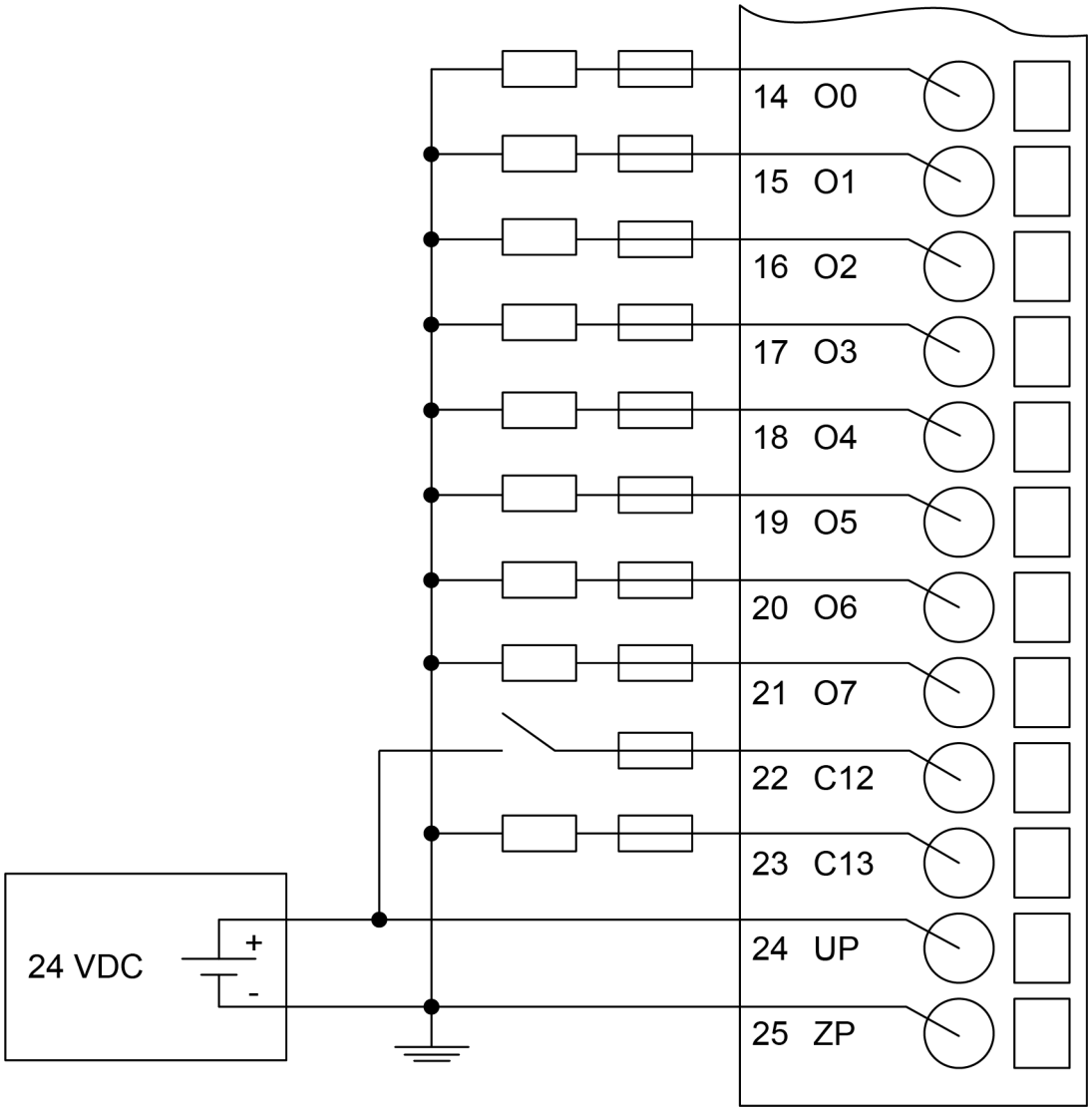


Fig. 130: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

80.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

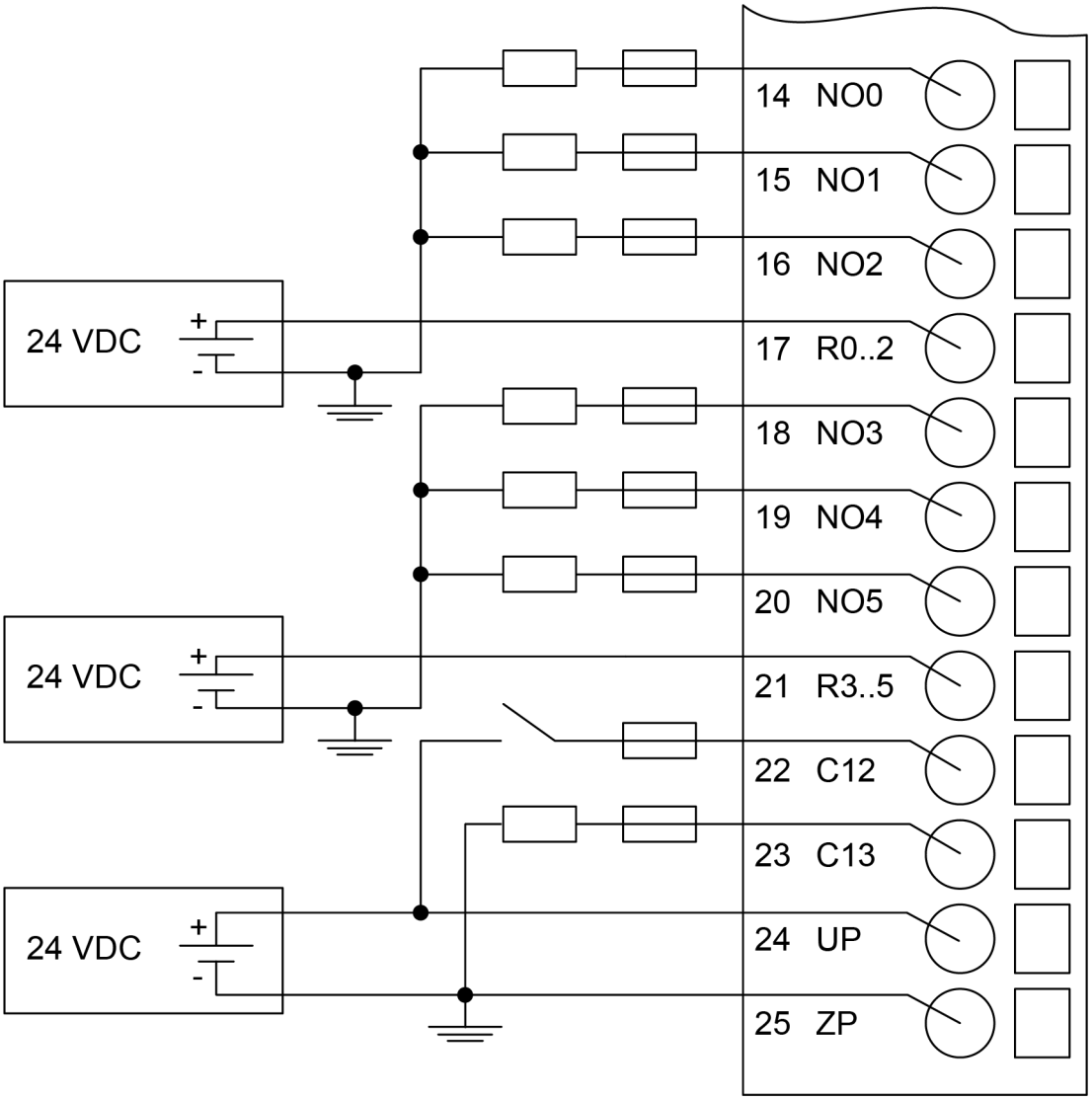


Fig. 131: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

80.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

81 PM5032-x-ETH

- PM5032-T-ETH
- PM5032-R-ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

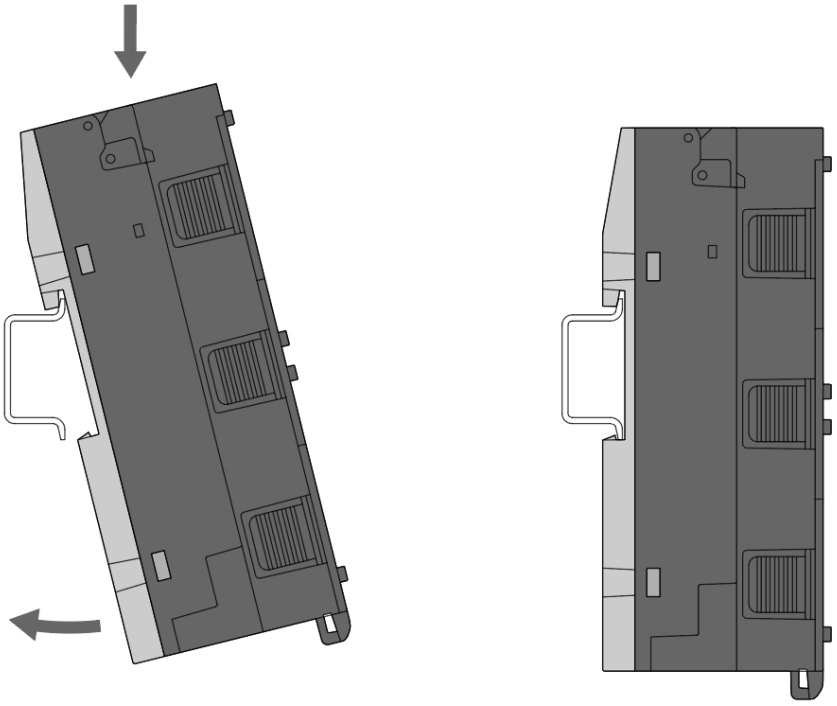
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

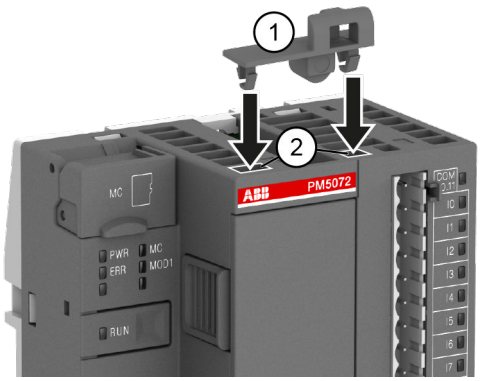
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

81.1 Assembly



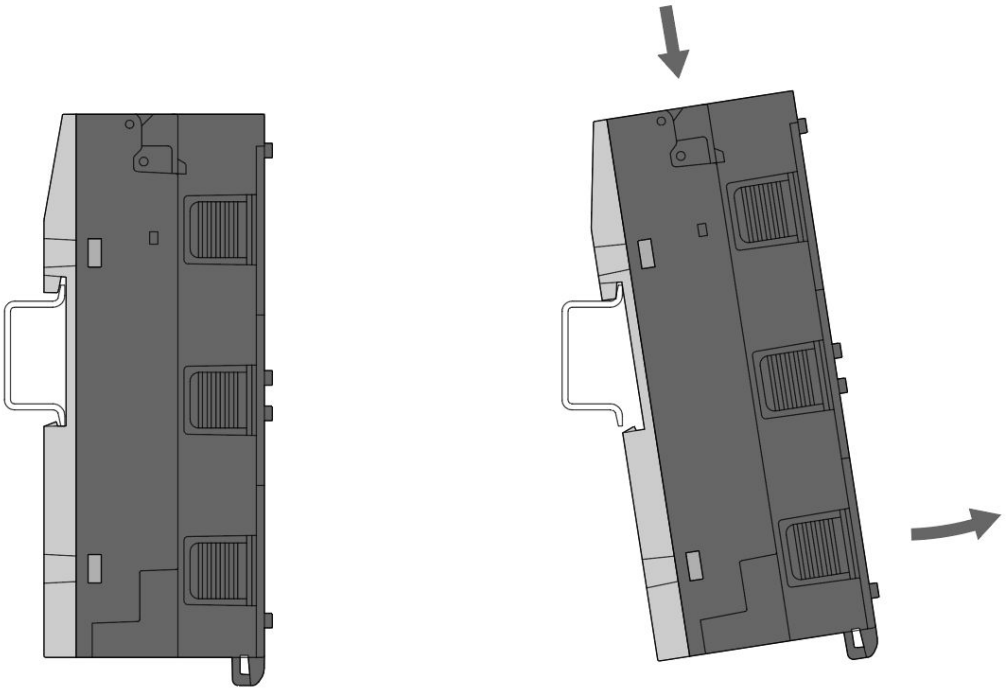
81.1.1 Assembly TA5301-CFA



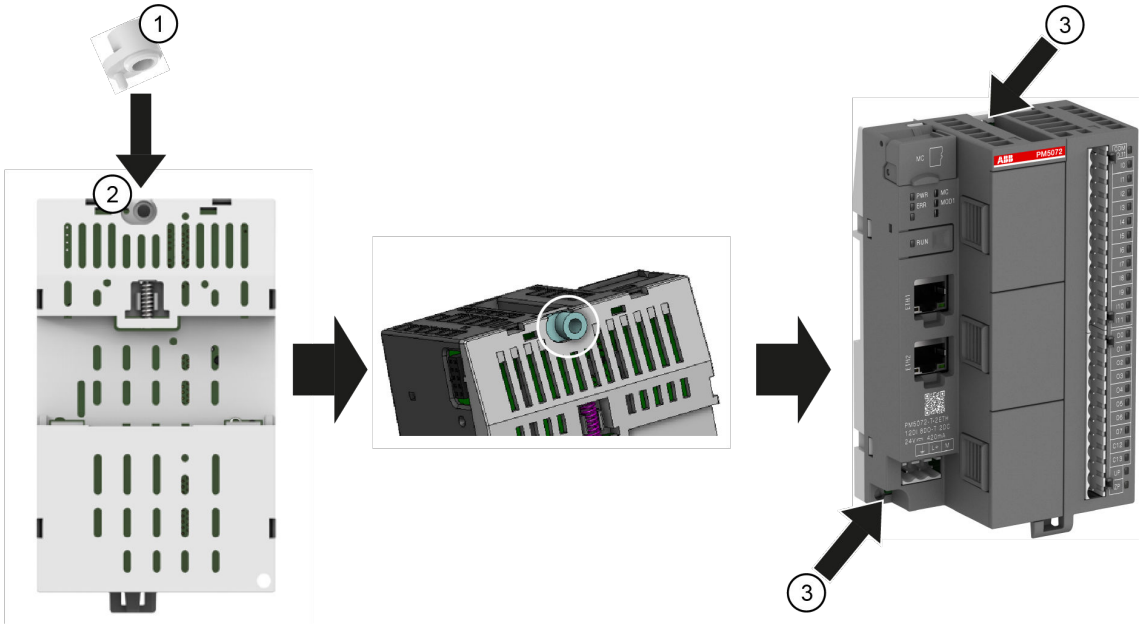
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

81.2 Disassembly



81.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

⇨

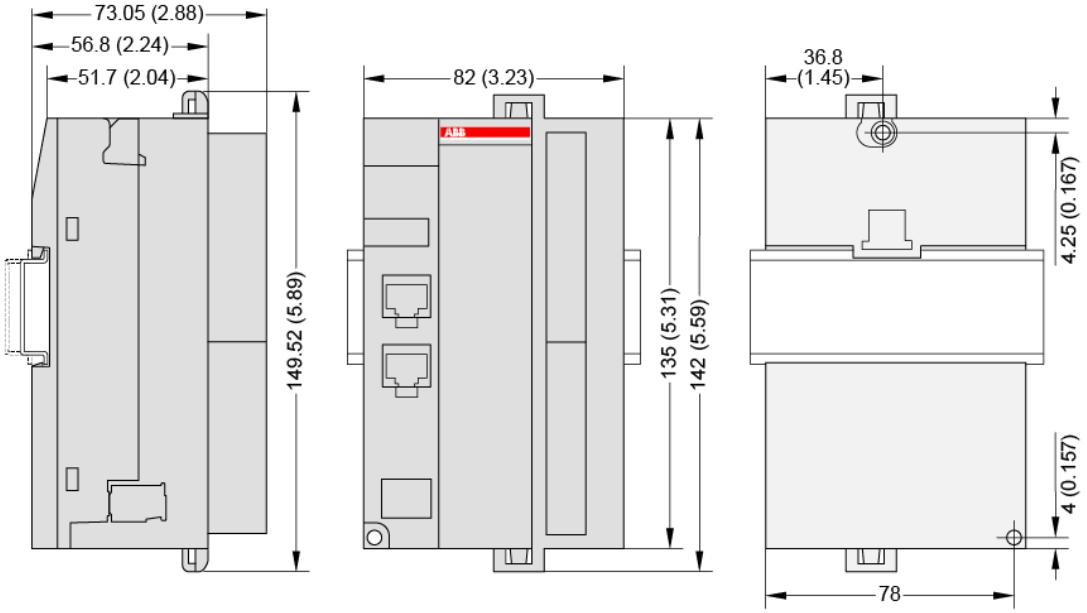
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

81.4 Dimensions



The dimensions are in mm and in brackets in inch.

81.5 Connections

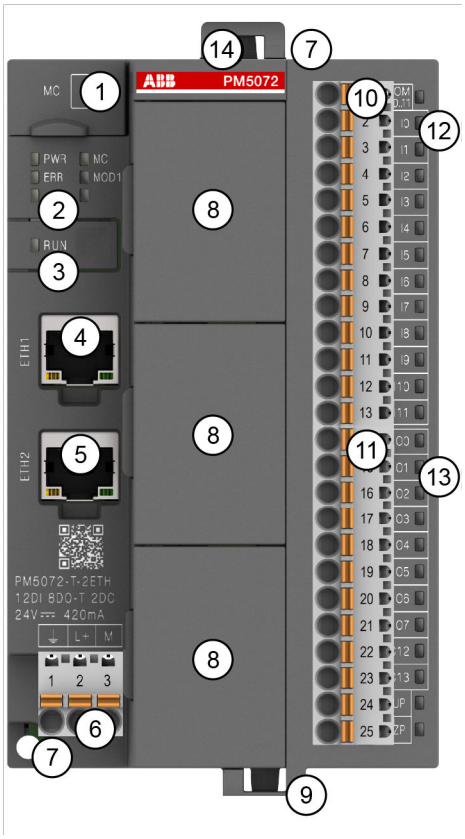


Fig. 132: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

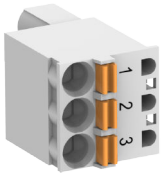
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

81.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

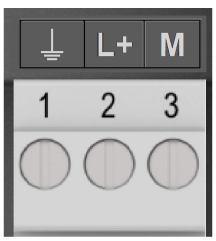
Table 19: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

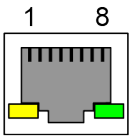
Risk of damaging the PLC due to improper voltage levels!

– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.
  Observe the **system data** and the **technical data** of the used module.

81.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 20: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

81.5.3 Onboard I/Os

81.5.3.1 Connections

81.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

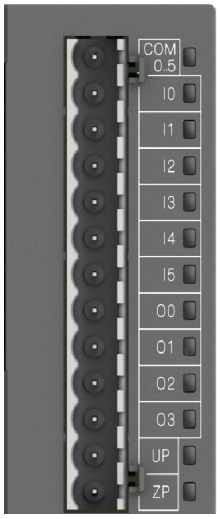


Table 21: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

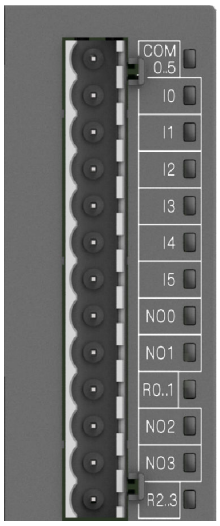


Table 22: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

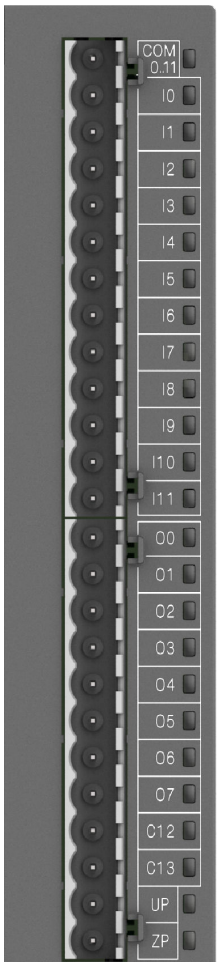


Table 23: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

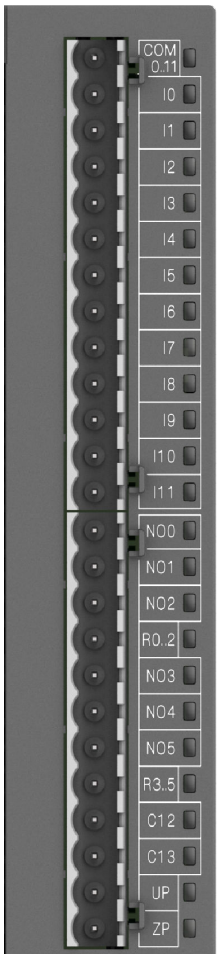


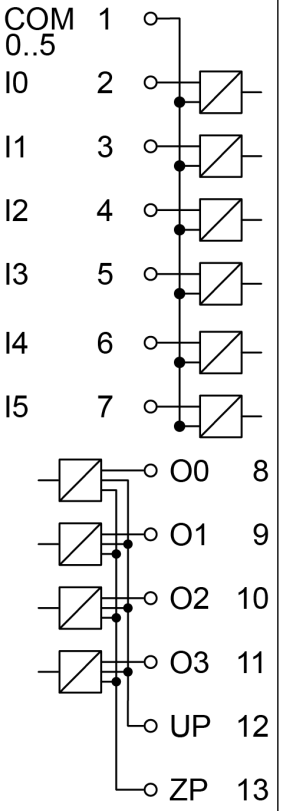
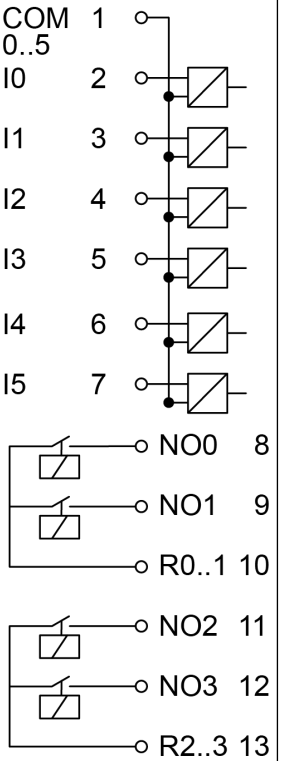
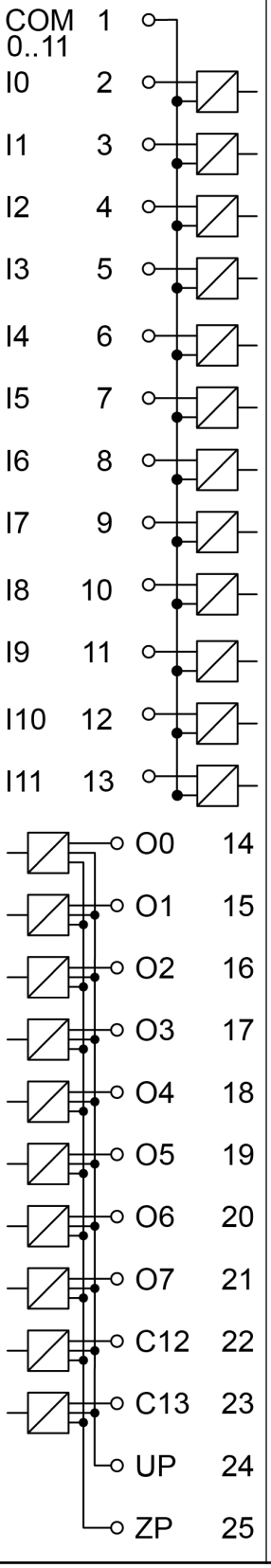
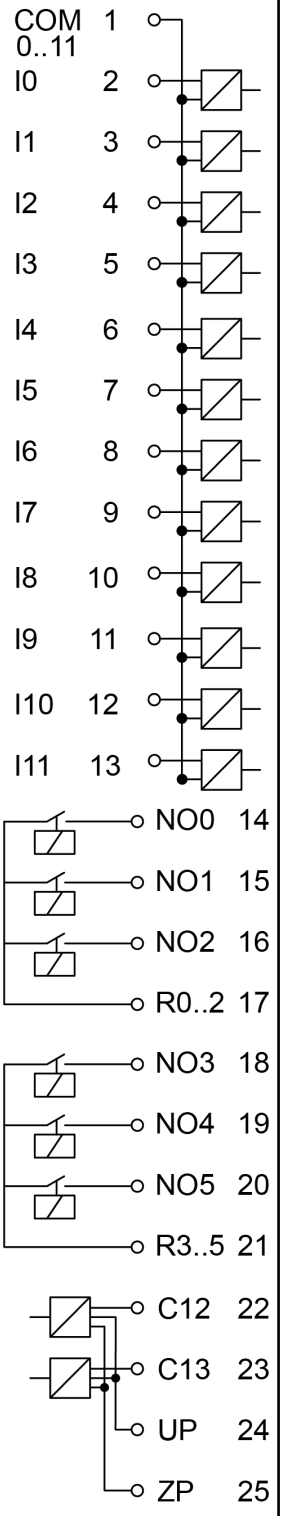
Table 24: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 25: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

81.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

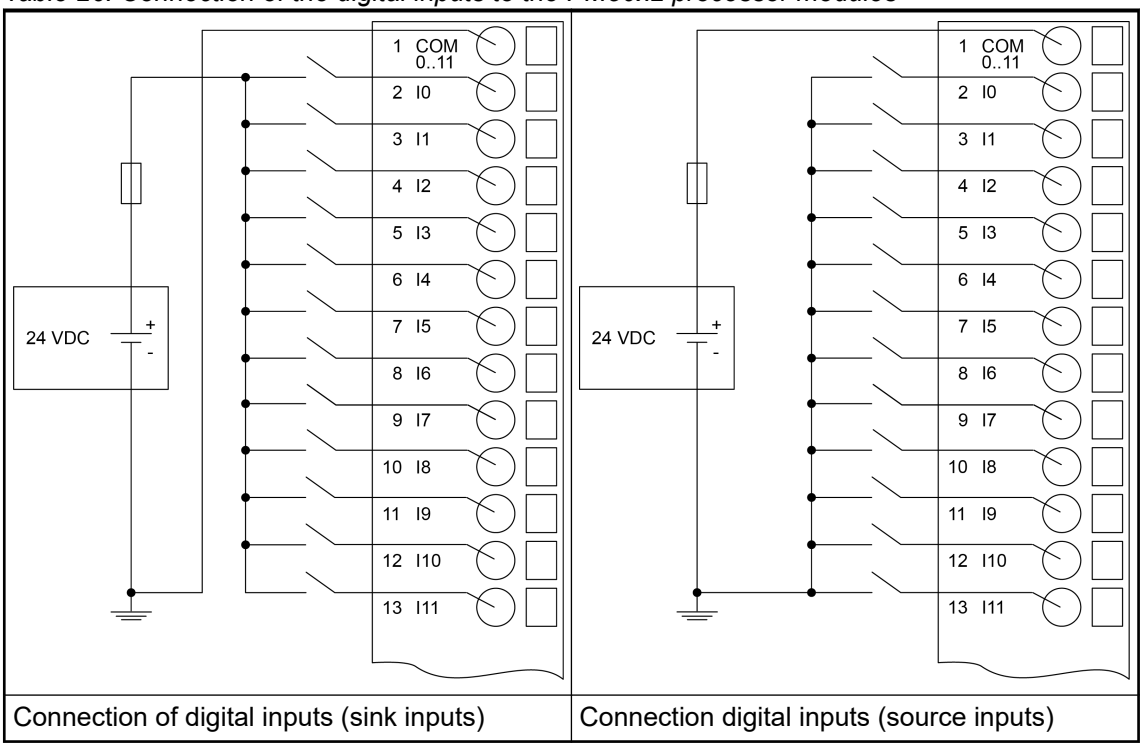
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 26: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

81.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

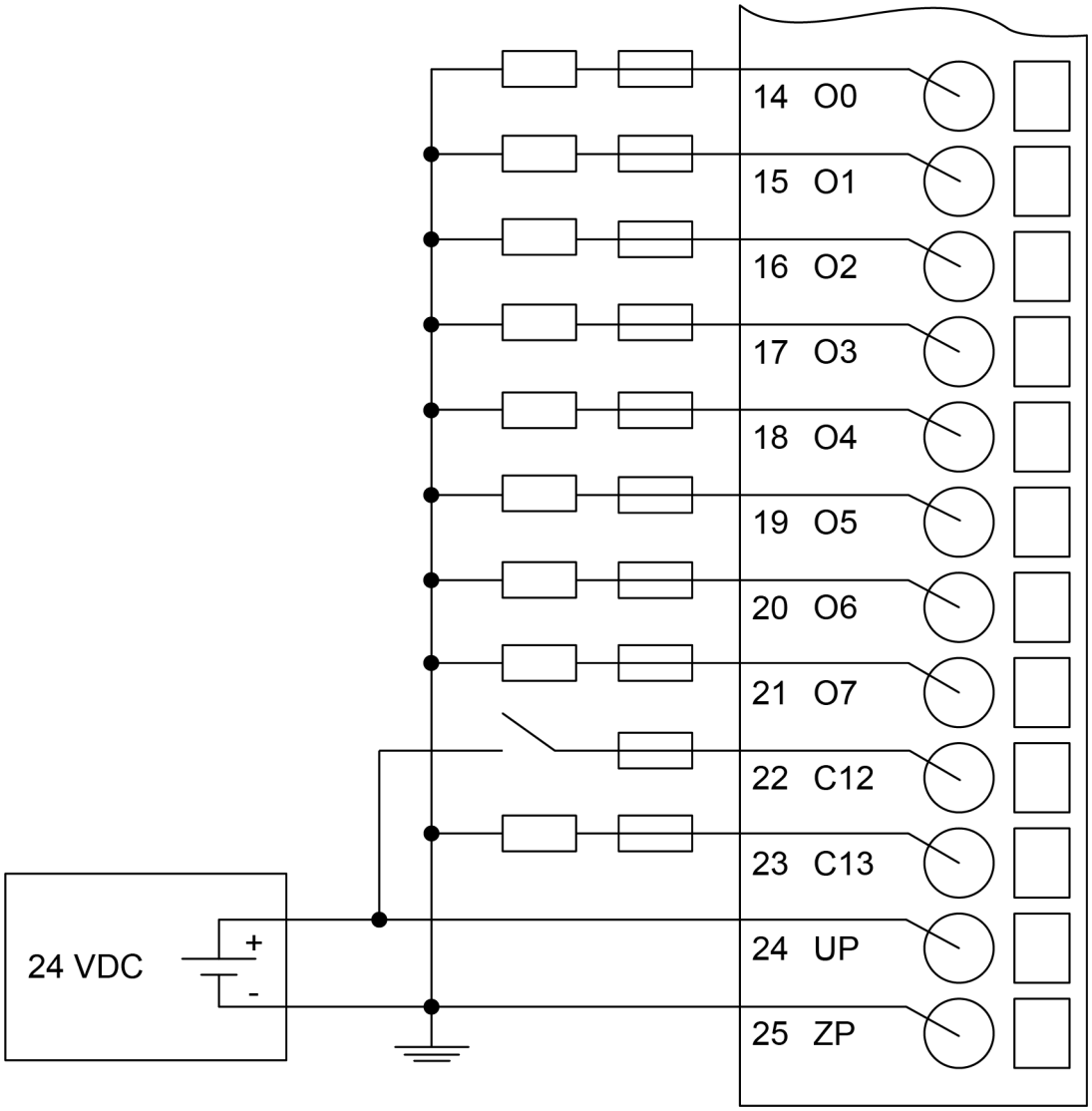


Fig. 133: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

81.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

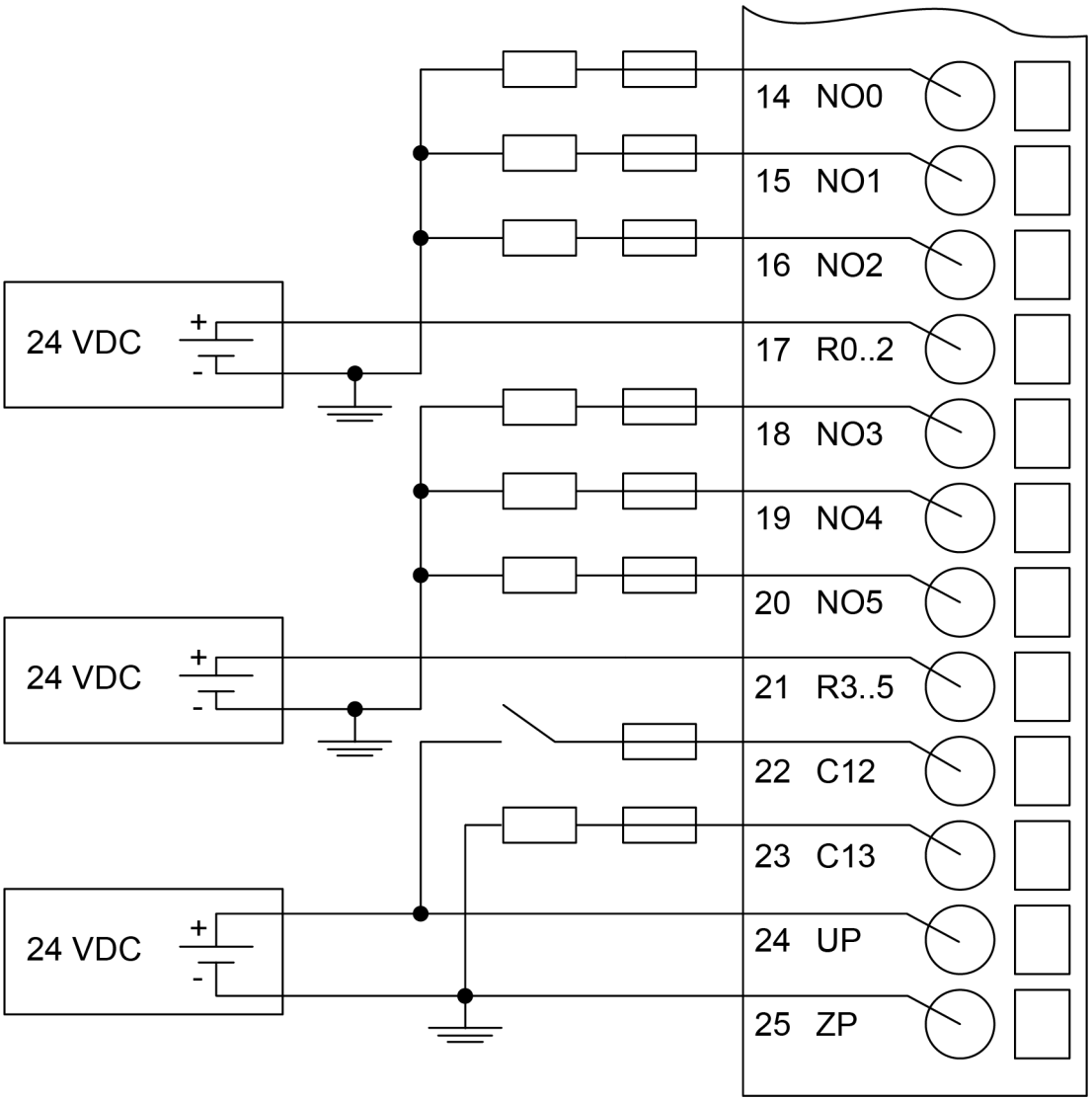


Fig. 134: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

81.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

82 PM5052-x-ETH

- PM5052-T-ETH
- PM5052-R-ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

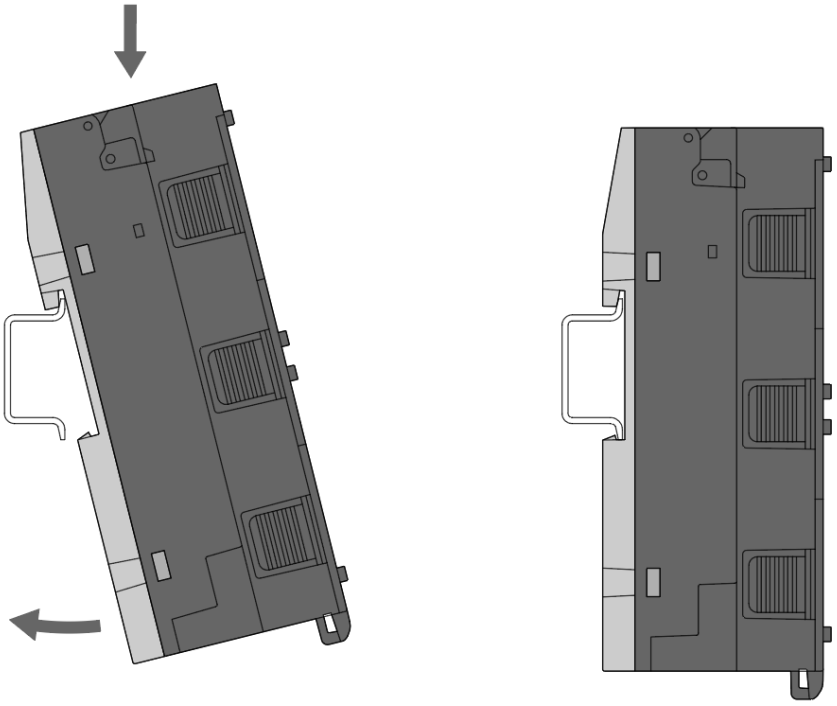
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

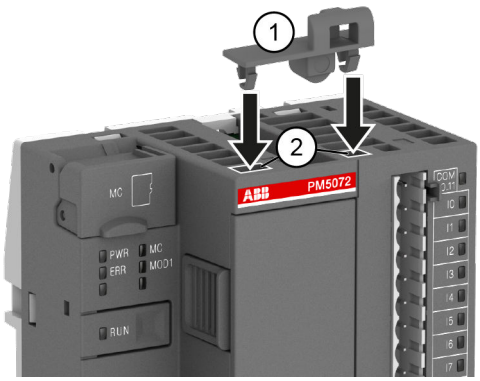
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

82.1 Assembly



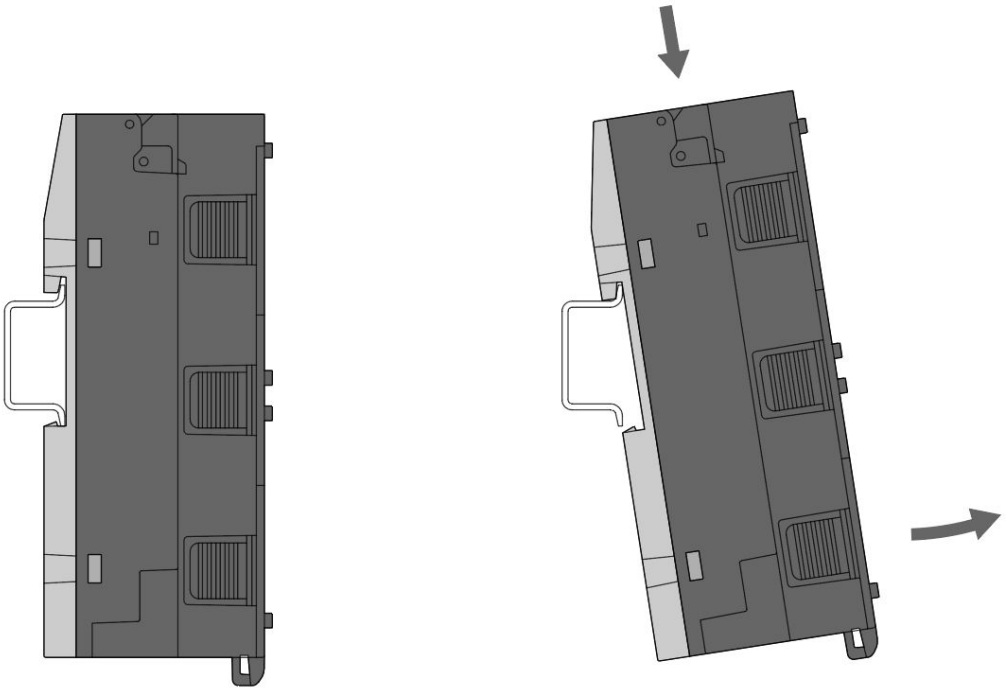
82.1.1 Assembly TA5301-CFA



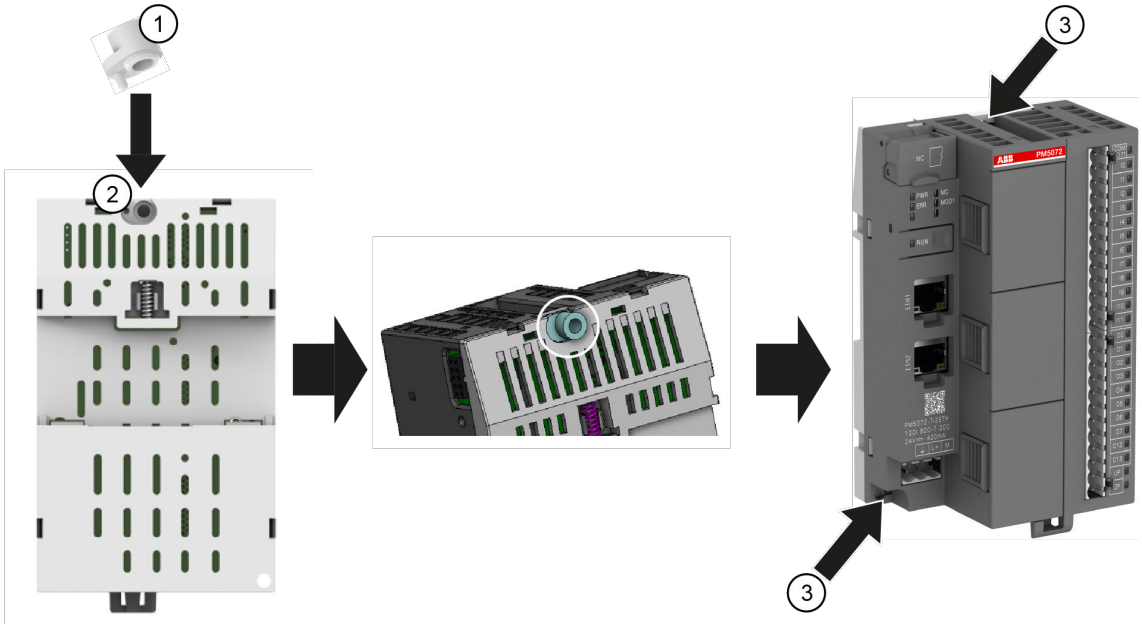
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

82.2 Disassembly



82.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

⇨

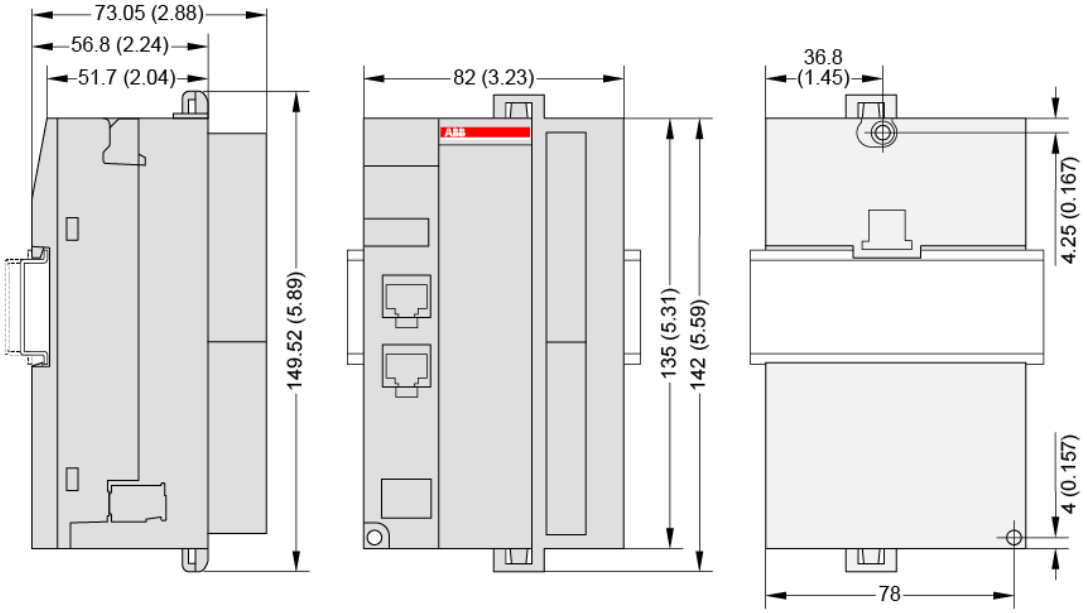
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

82.4 Dimensions



The dimensions are in mm and in brackets in inch.

82.5 Connections

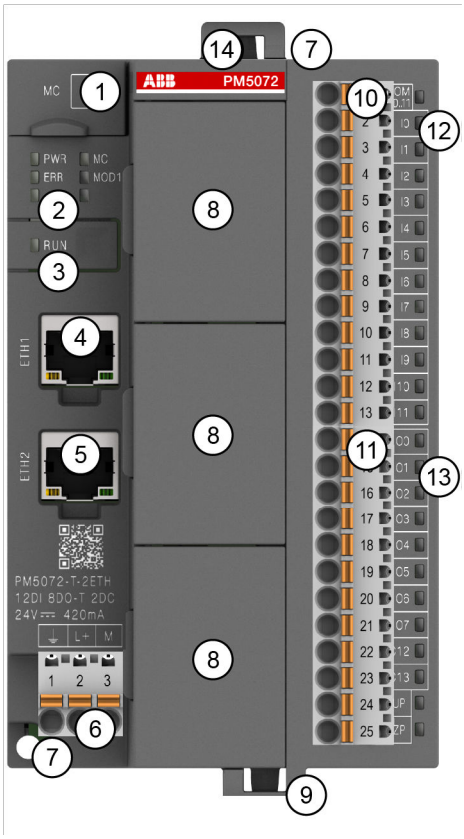


Fig. 135: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

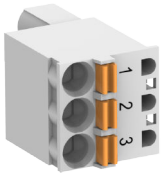
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

82.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

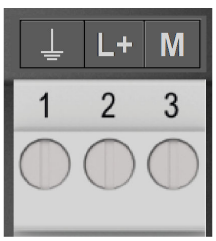
Table 27: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

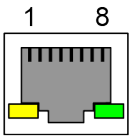
Risk of damaging the PLC due to improper voltage levels!

– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.
  Observe the **system data** and the **technical data** of the used module.

82.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 28: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

82.5.3 Onboard I/Os

82.5.3.1 Connections

82.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

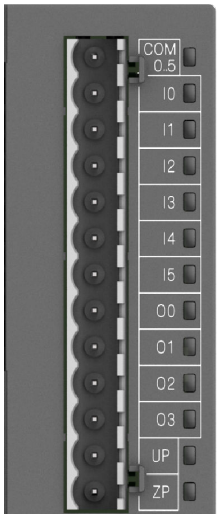


Table 29: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

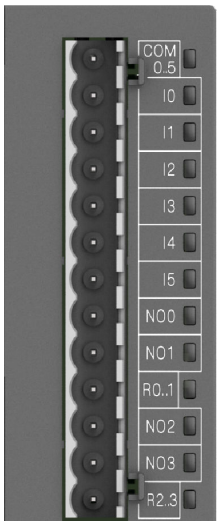


Table 30: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

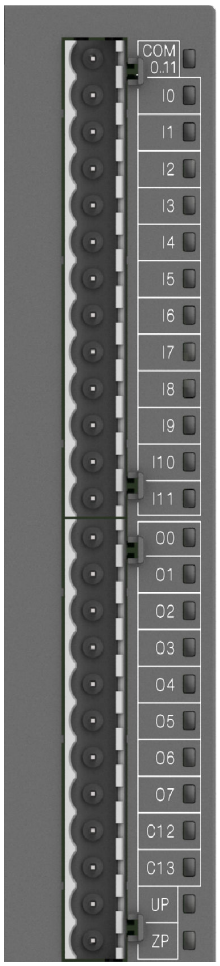


Table 31: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

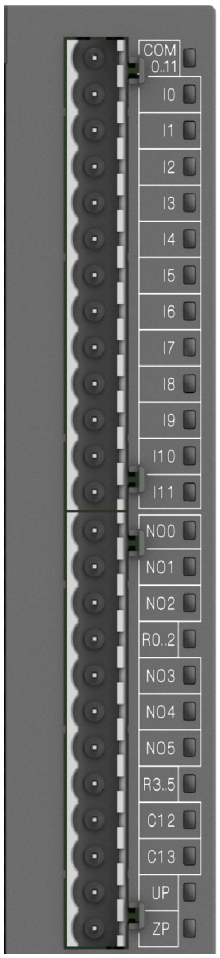


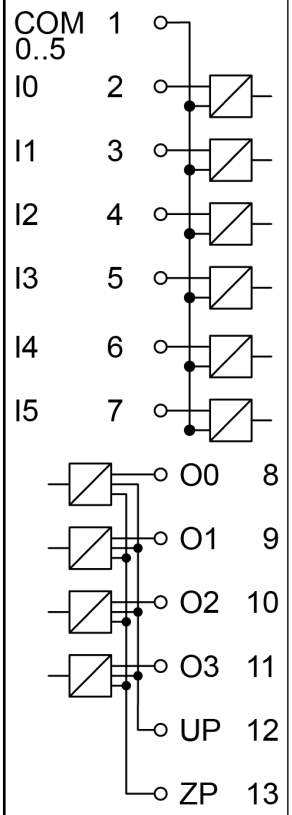
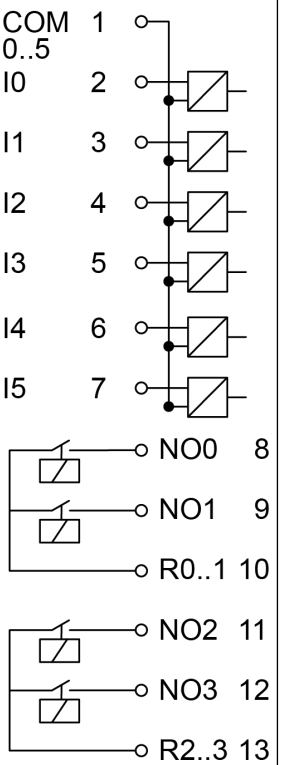
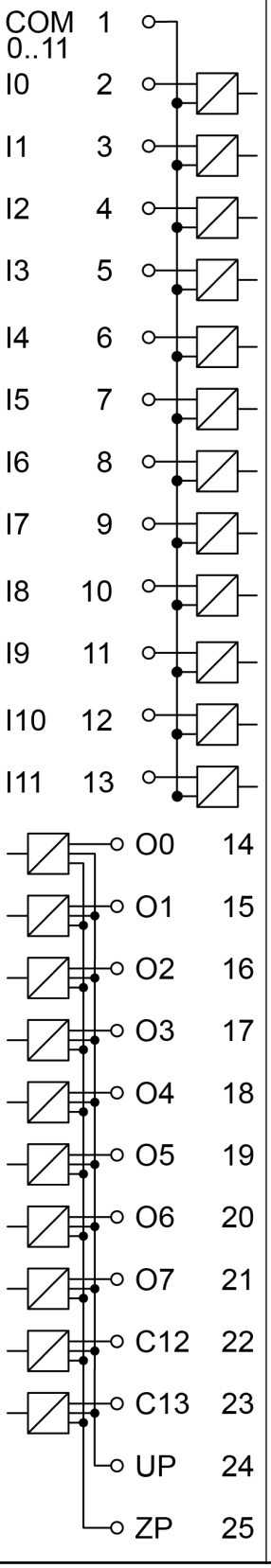
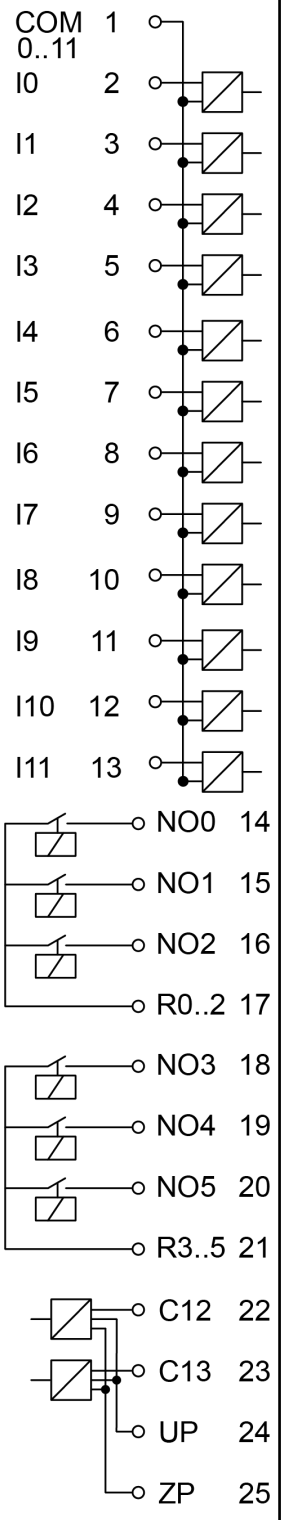
Table 32: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 33: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

82.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

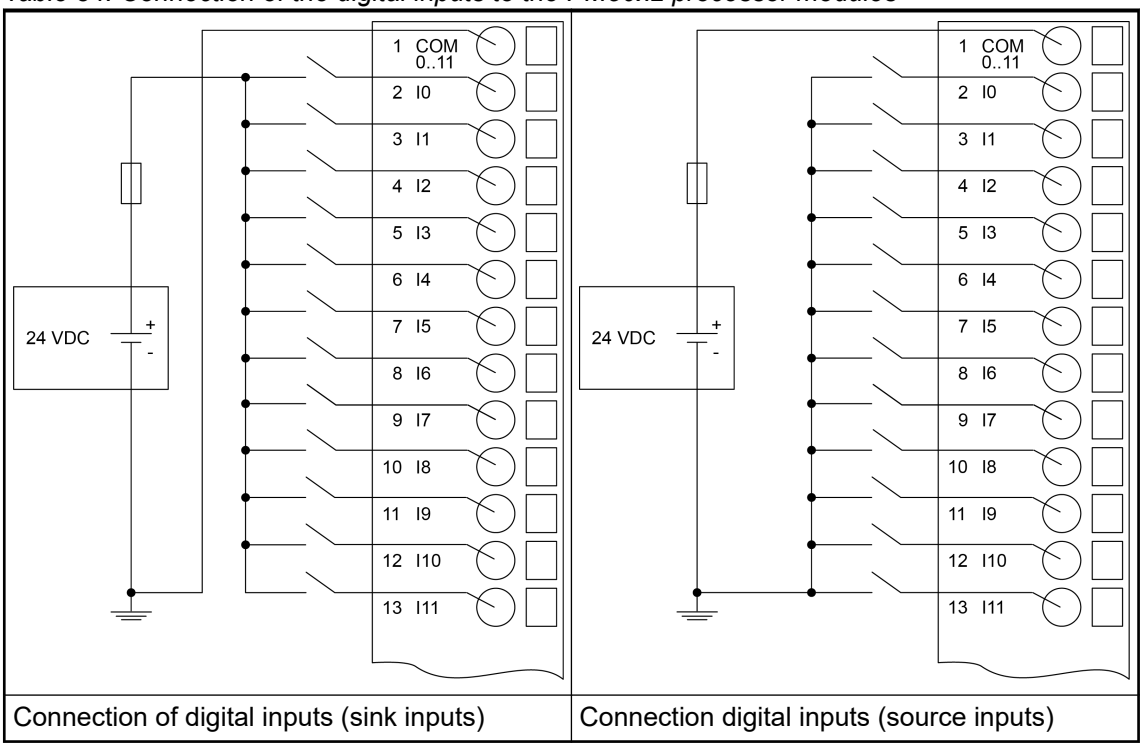
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 34: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

82.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

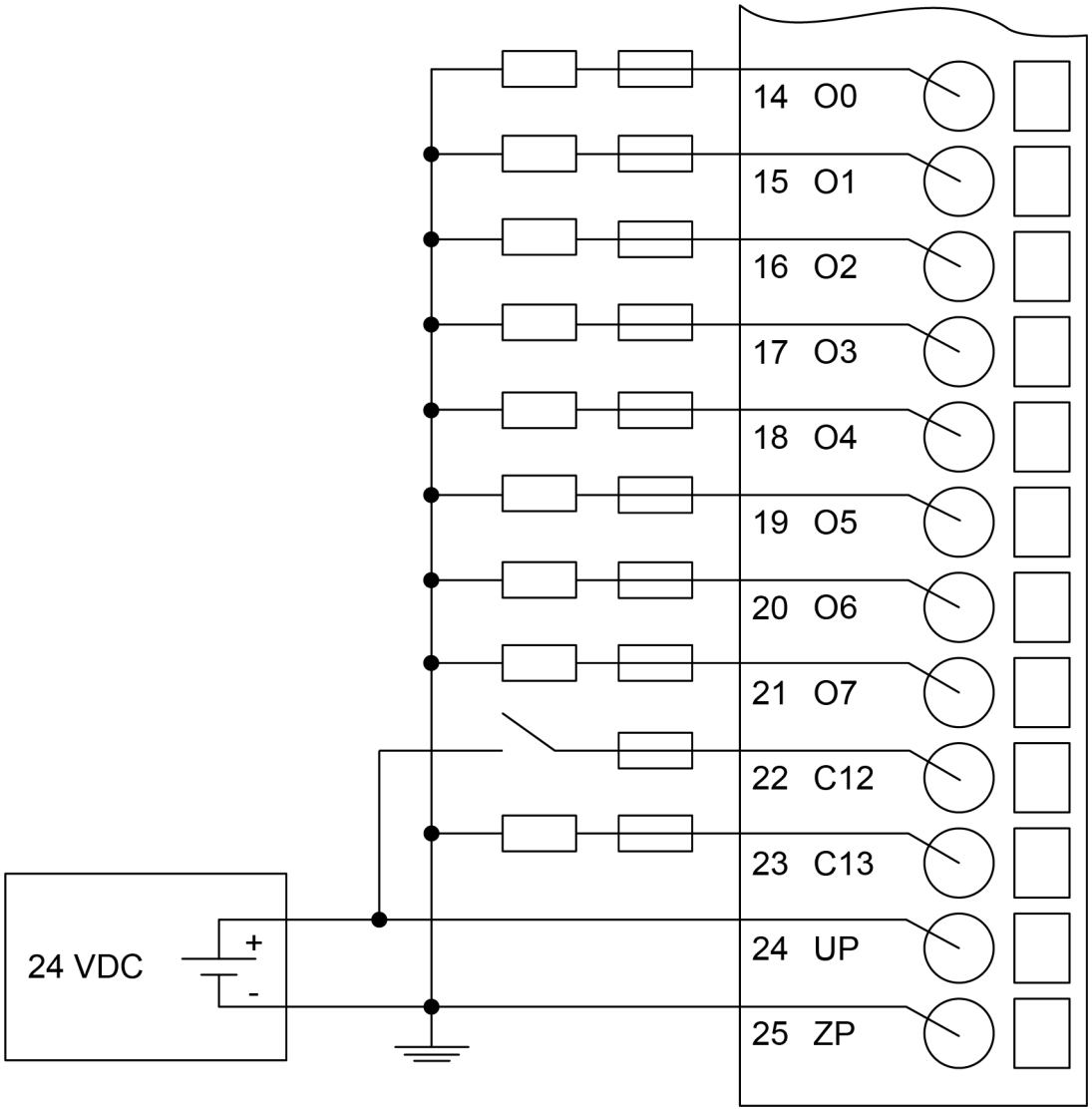


Fig. 136: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

82.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

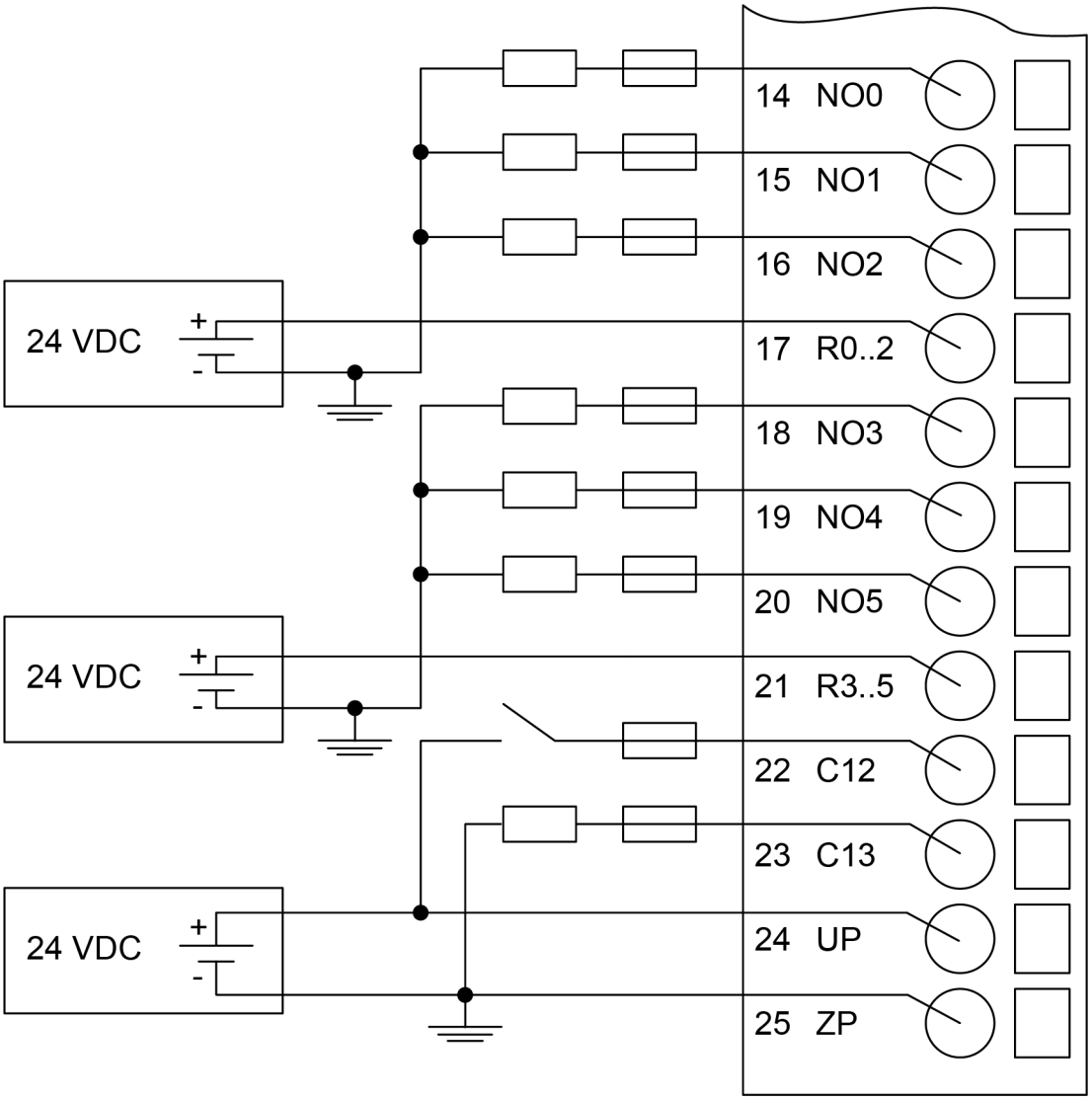


Fig. 137: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

82.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

83 PM5072-T-2ETH(W)

- PM5072-T-2ETH
- PM5072-T-2ETHW



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

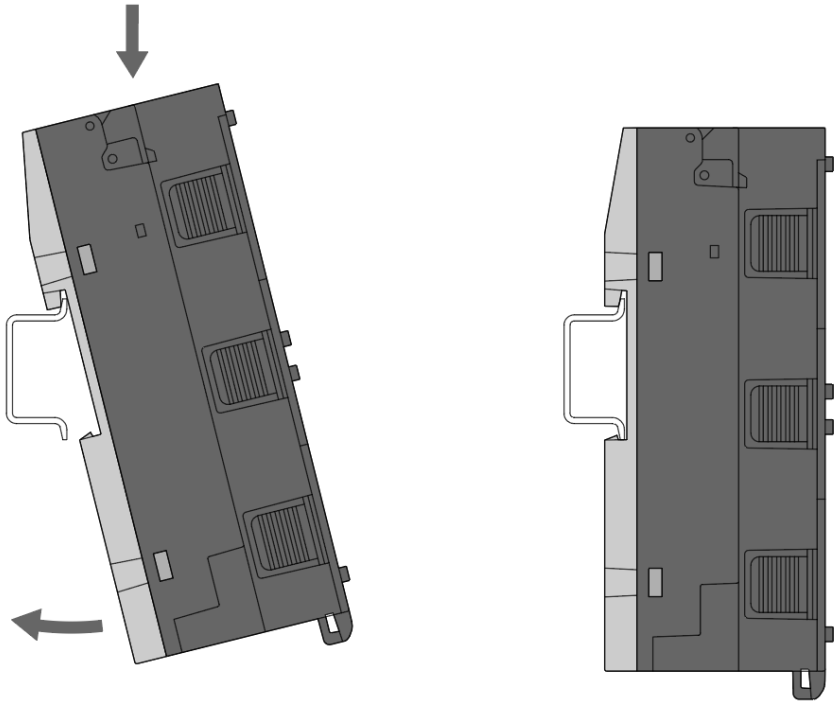
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

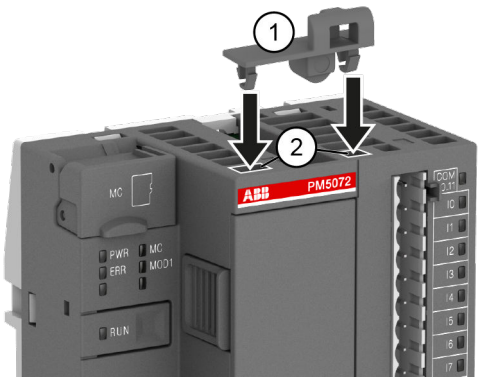
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

83.1 Assembly



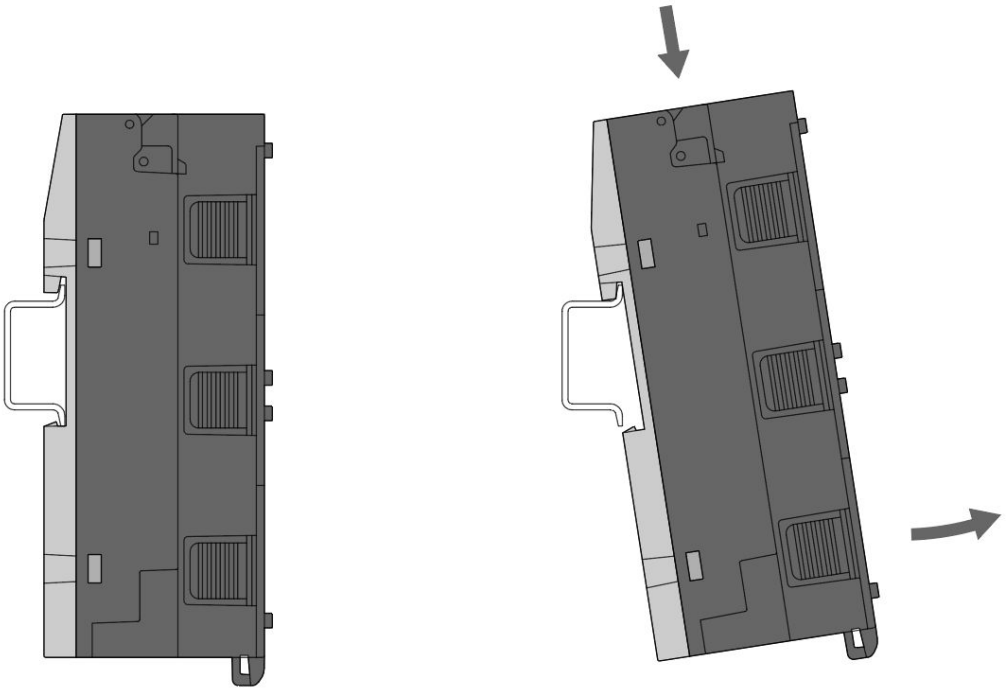
83.1.1 Assembly TA5301-CFA



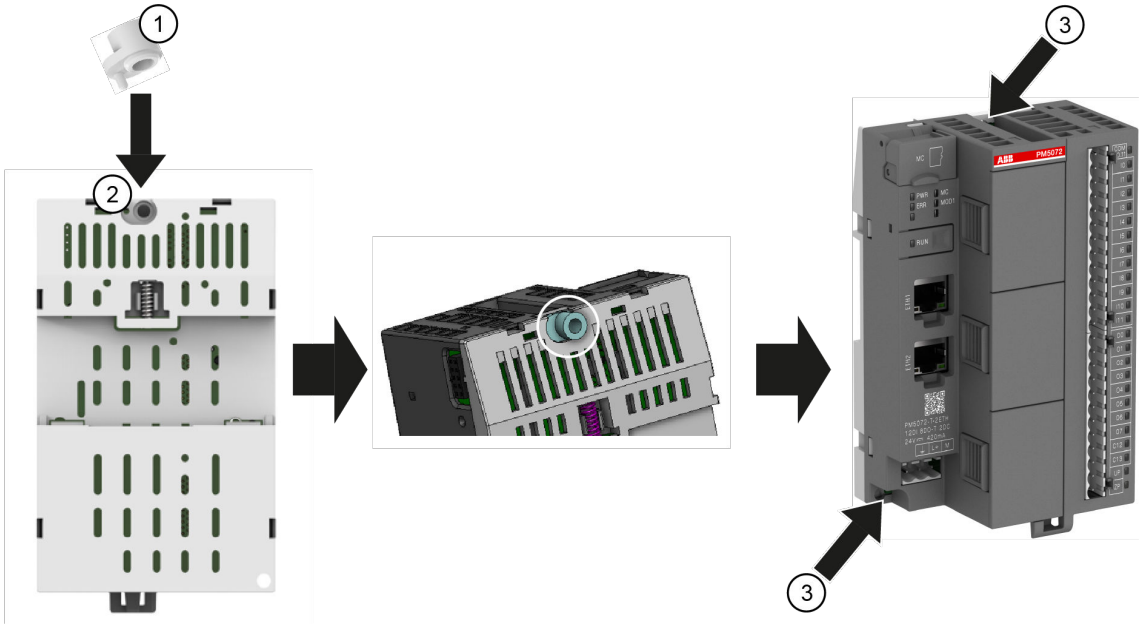
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

83.2 Disassembly



83.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

   ⇨

   NOTICE!
   Use screw mounting accessory to avoid damage!
   For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

   ⇨

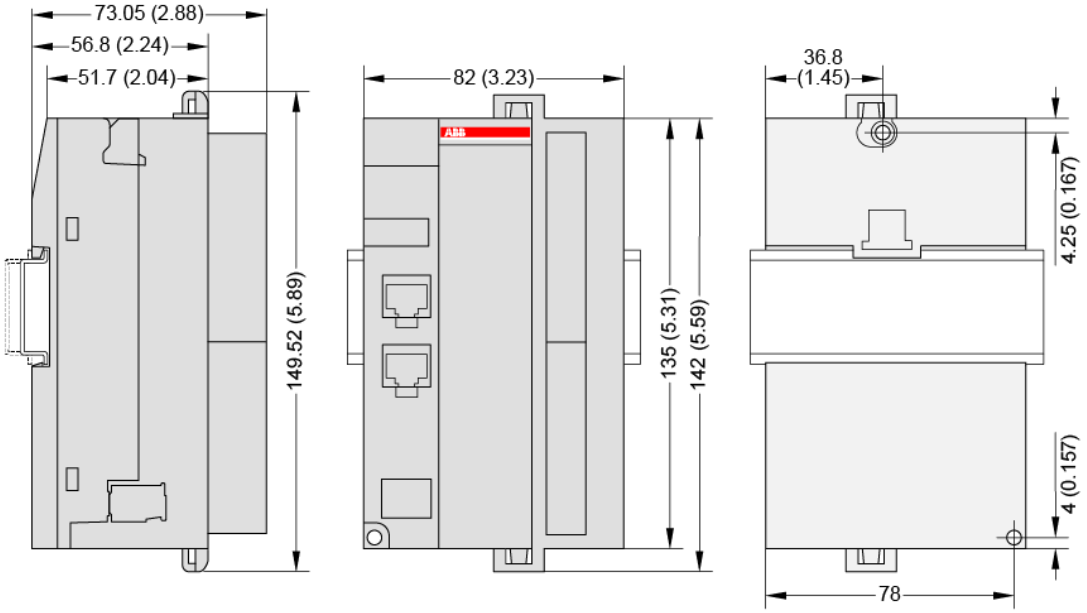
   With screw mounting, the processor module is grounded through the screws.

   It is necessary that

   – *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
   – *the mounting plate is grounded*
   – *the screws have a good electrical contact to the mounting plate*

   To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

83.4 Dimensions



The dimensions are in mm and in brackets in inch.

83.5 Connections

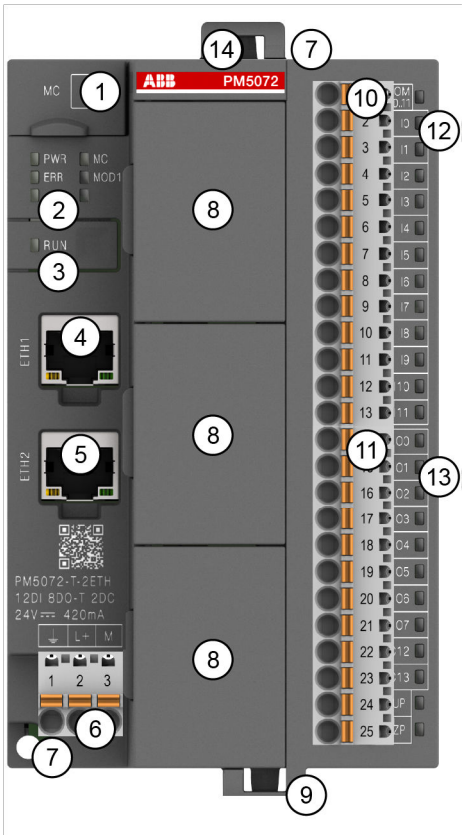


Fig. 138: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

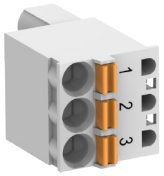
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

83.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

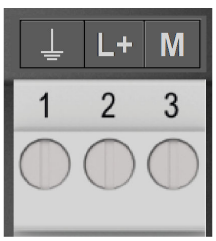
Table 35: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

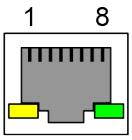
Risk of damaging the PLC due to improper voltage levels!

– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.
  Observe the **system data** and the **technical data** of the used module.

83.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 36: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

83.5.3 Onboard I/Os

83.5.3.1 Connections

83.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

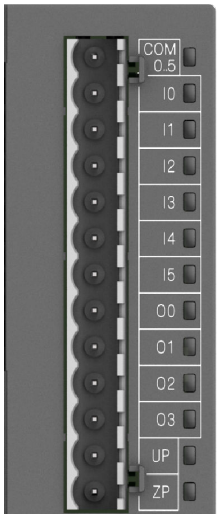


Table 37: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

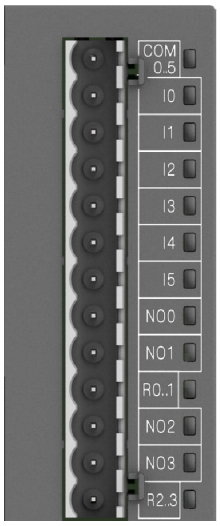


Table 38: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

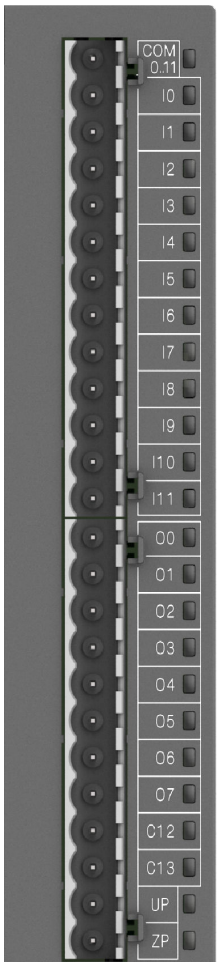


Table 39: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

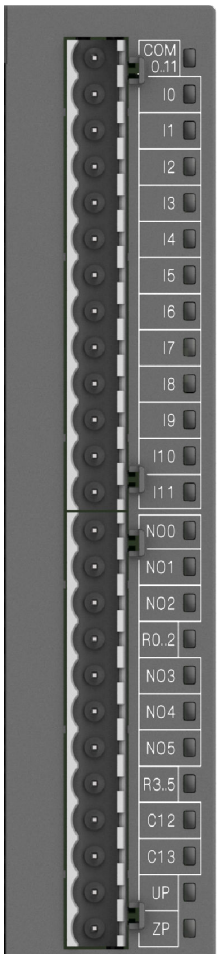


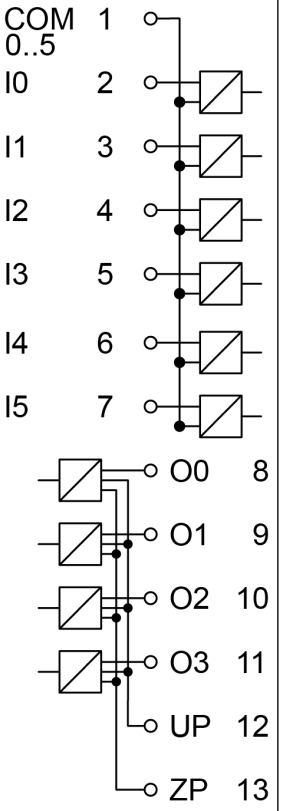
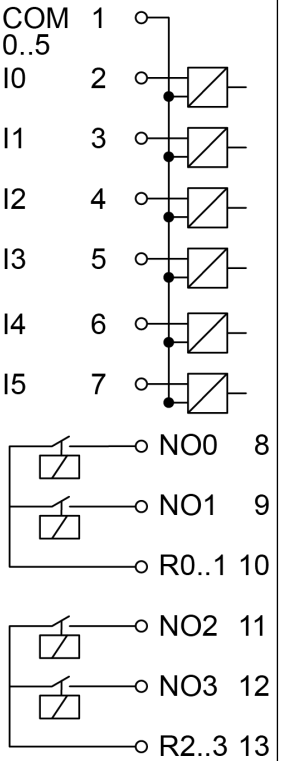
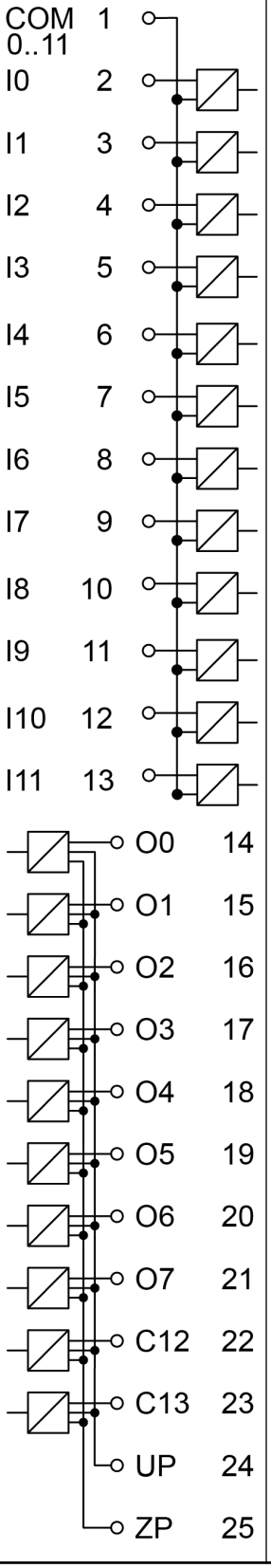
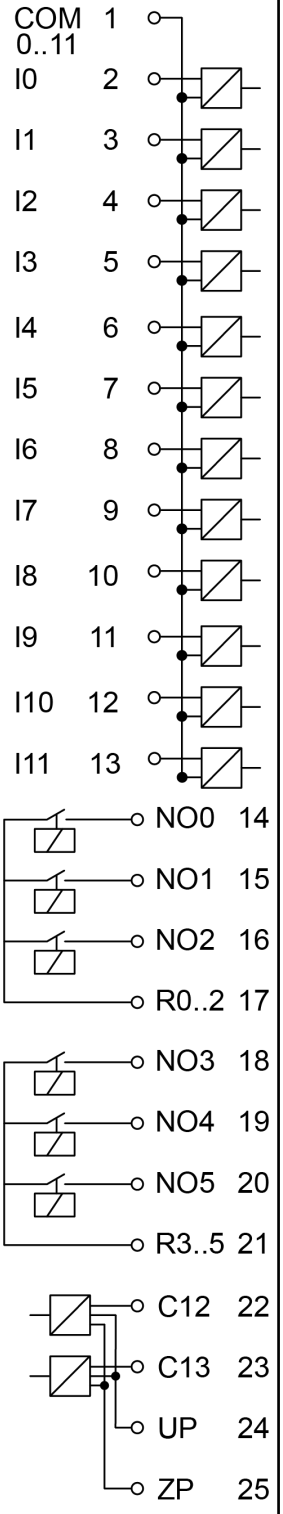
Table 40: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 41: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

83.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

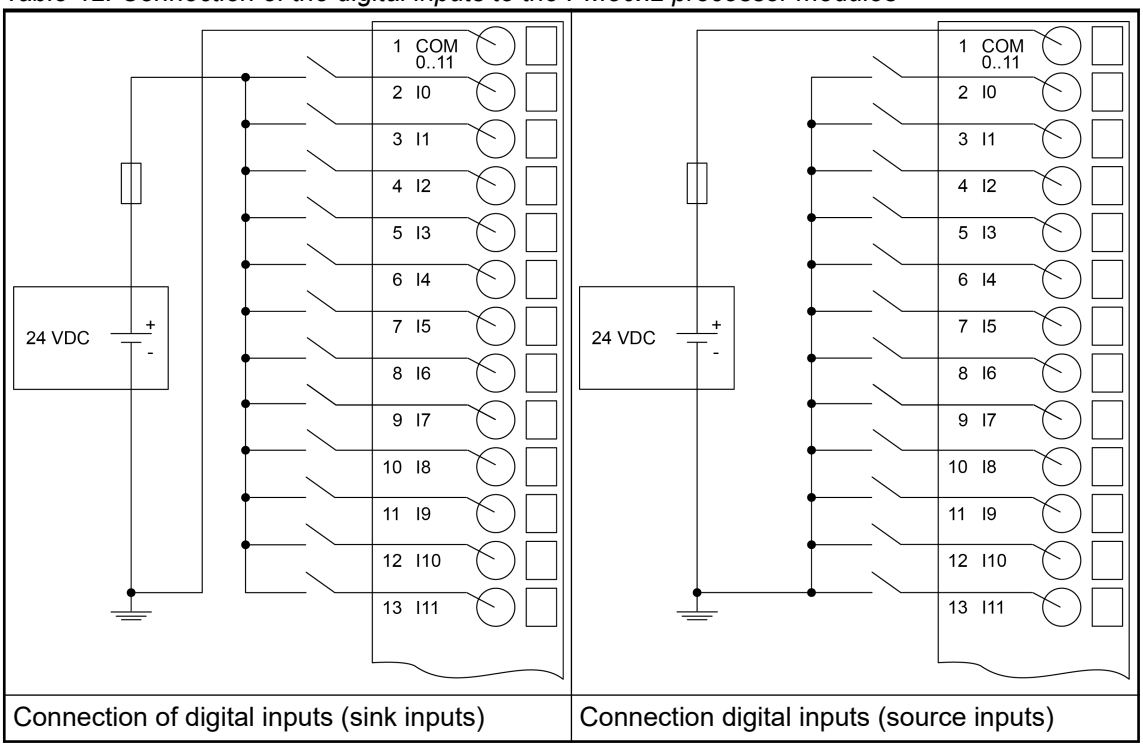
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 42: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

83.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

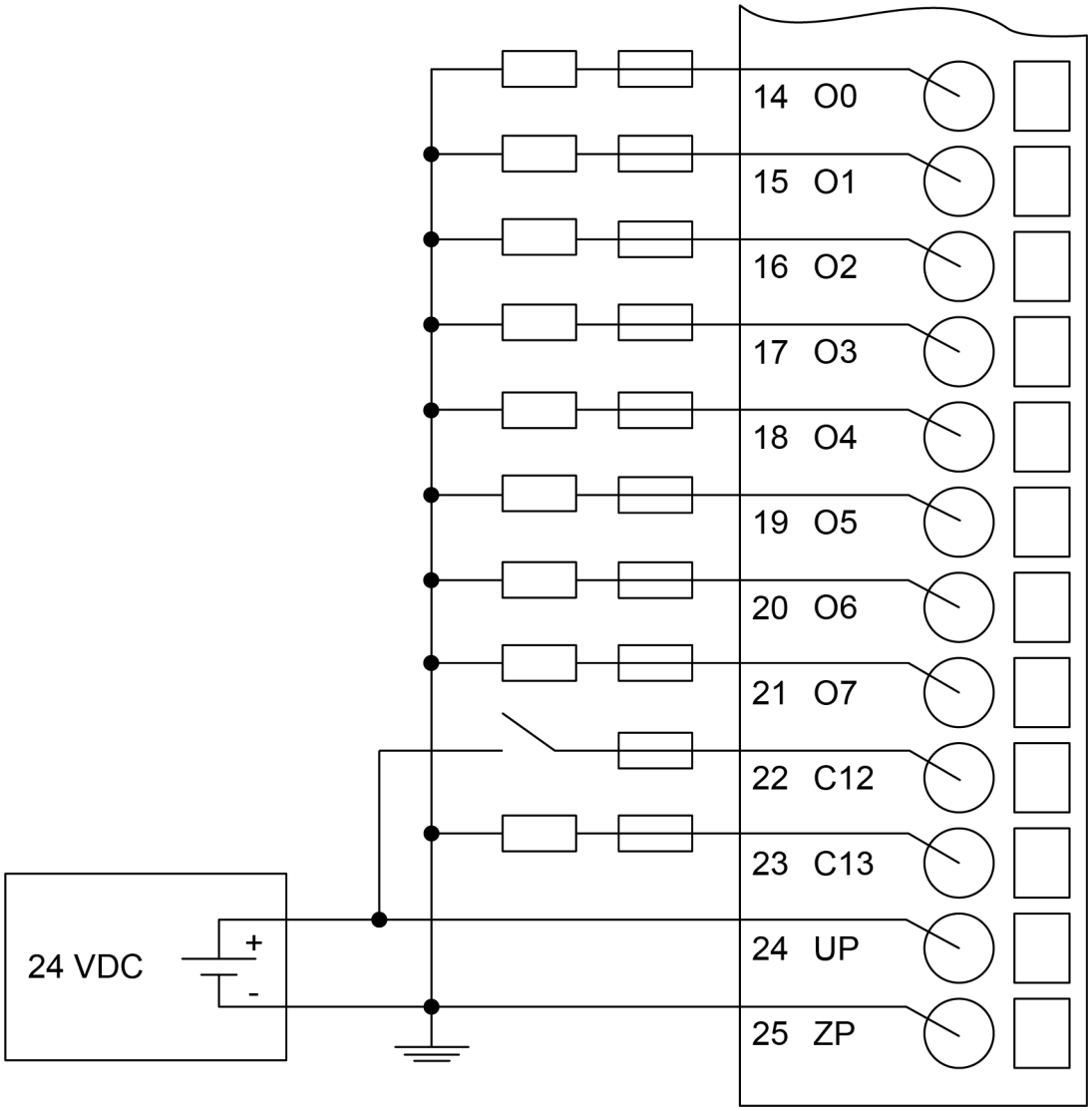


Fig. 139: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

83.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

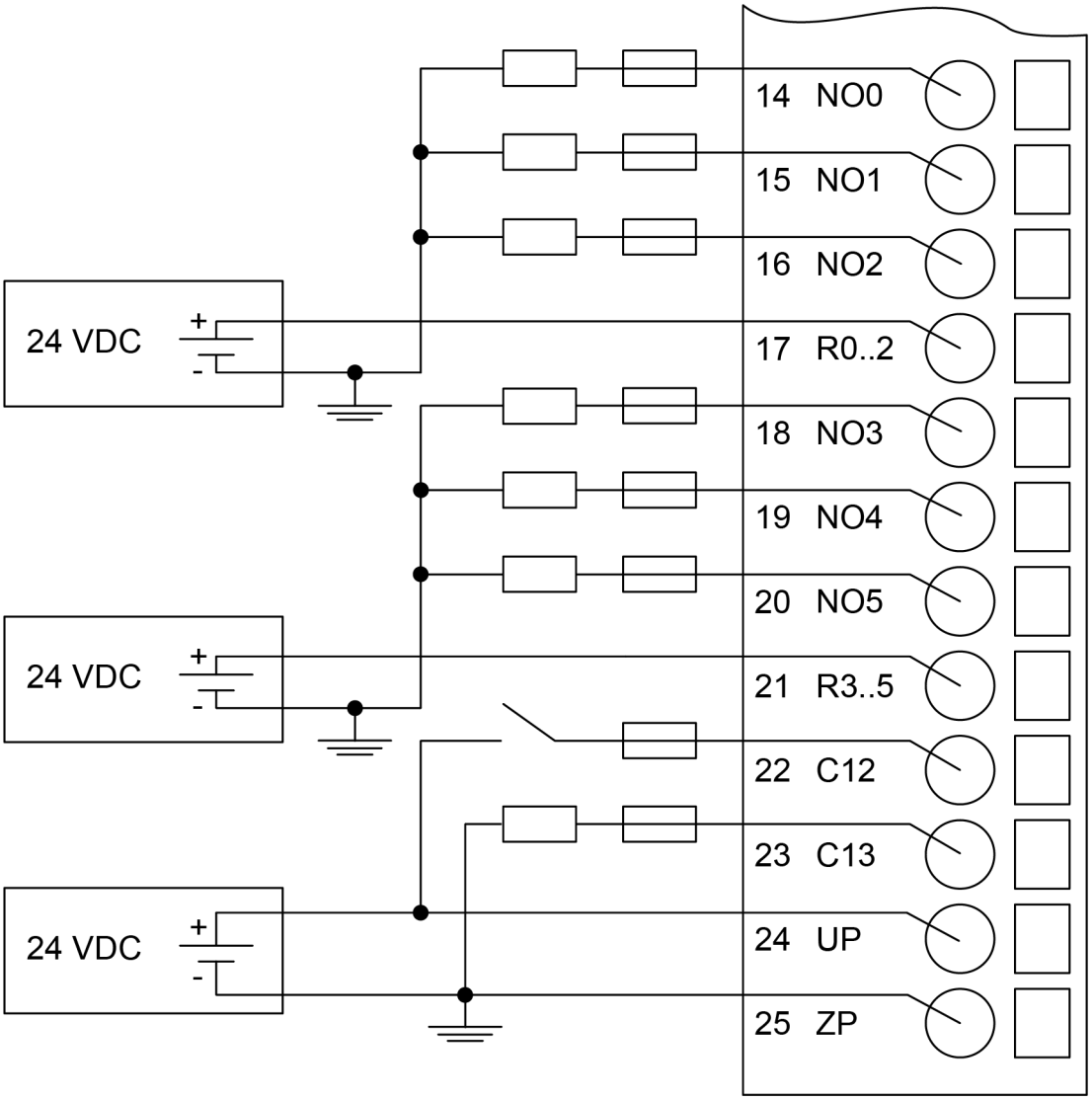


Fig. 140: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

83.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

84 PM5082-T-2ETH

- PM5082-T-2ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

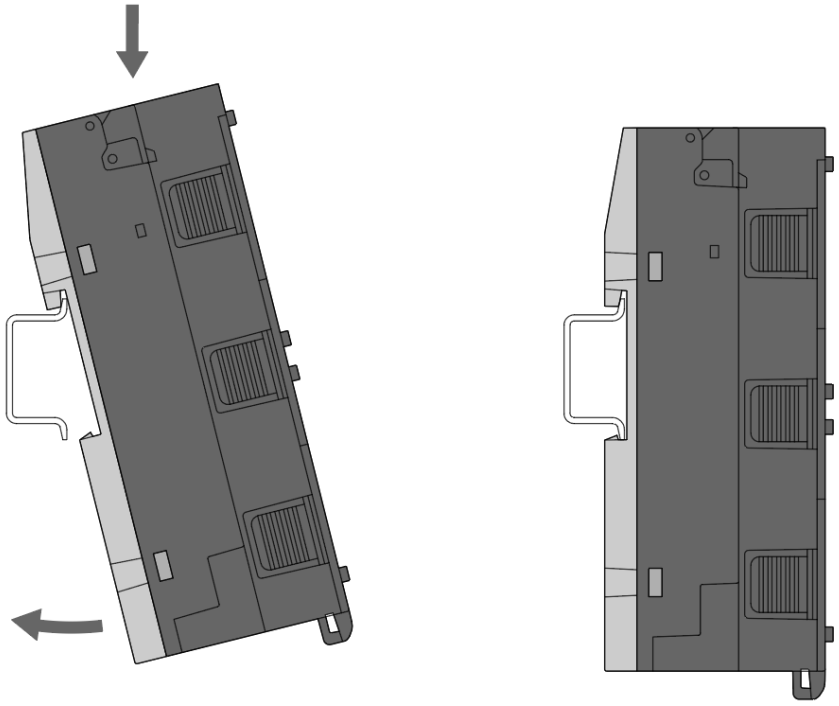
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

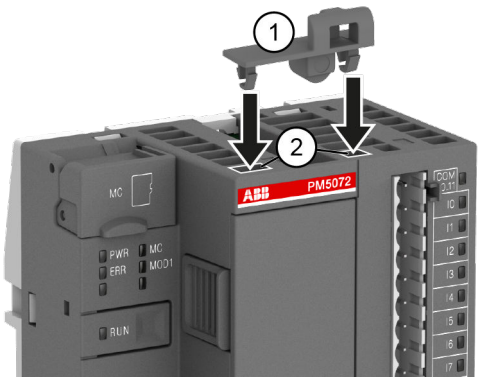
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

84.1 Assembly



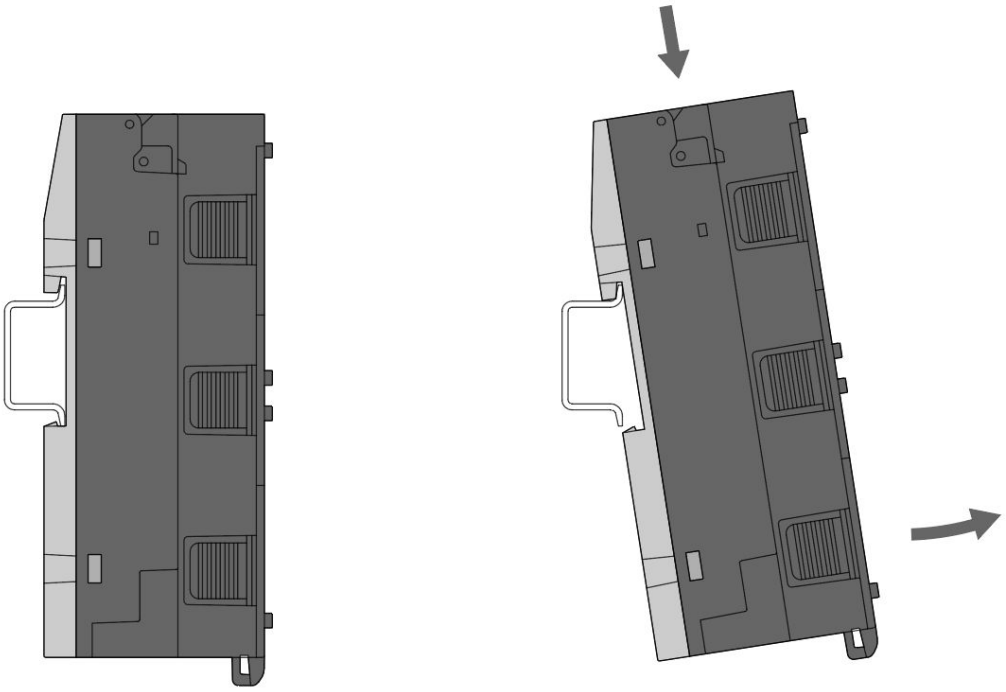
84.1.1 Assembly TA5301-CFA



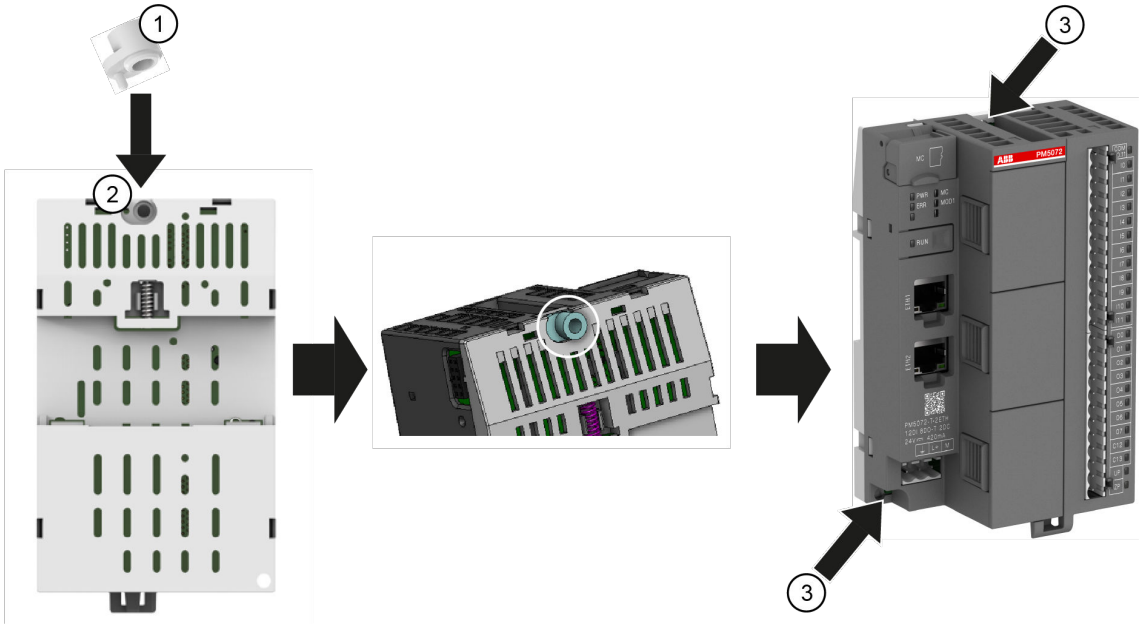
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

84.2 Disassembly



84.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

⇨

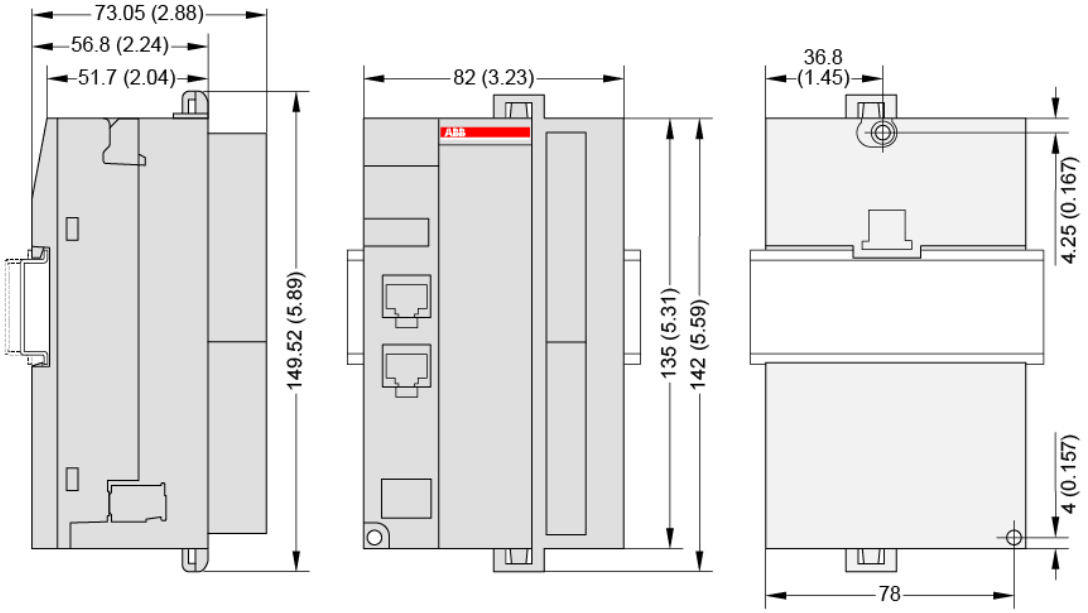
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

84.4 Dimensions



The dimensions are in mm and in brackets in inch.

84.5 Connections

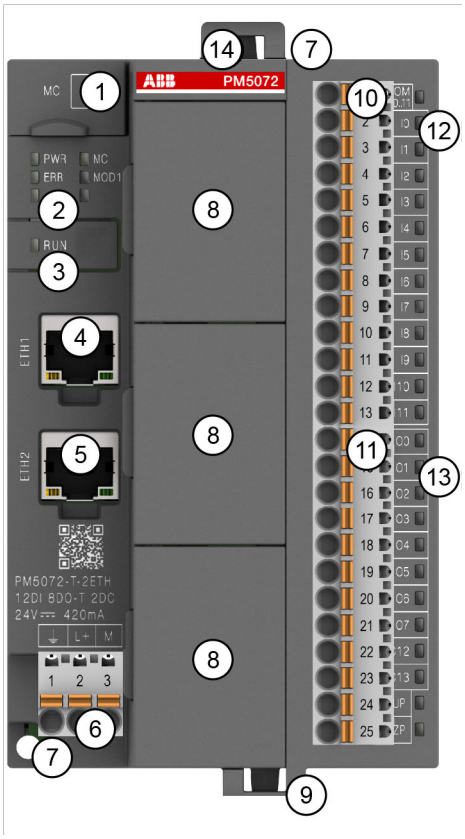


Fig. 141: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

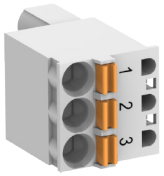
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

84.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

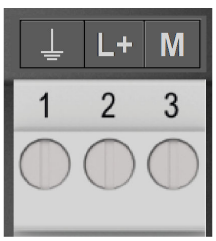
Table 43: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

Risk of damaging the PLC due to improper voltage levels!

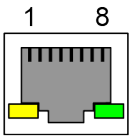
– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.

Observe the **system data** and the **technical data** of the used module.

84.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 44: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

84.5.3 Onboard I/Os

84.5.3.1 Connections

84.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

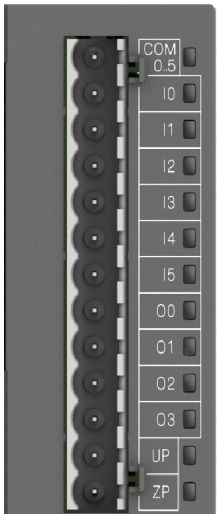


Table 45: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

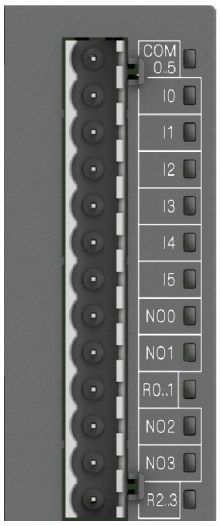


Table 46: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

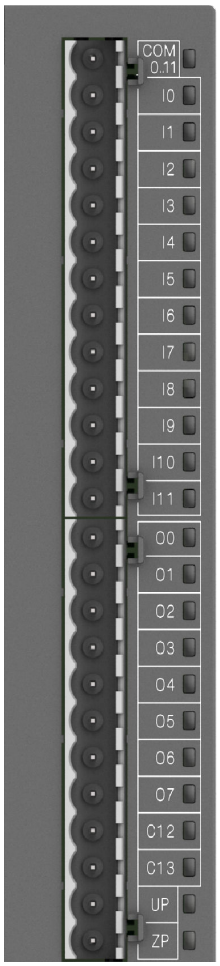


Table 47: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

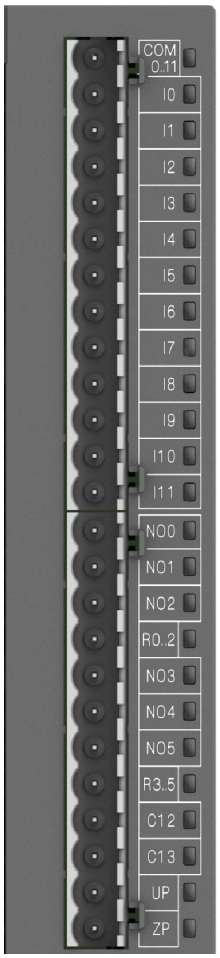


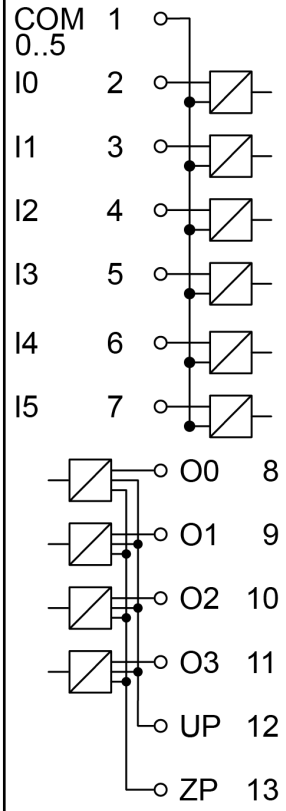
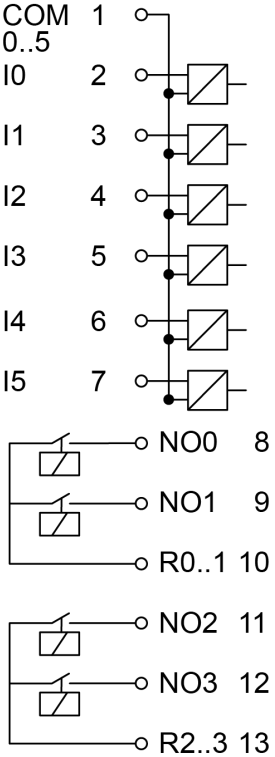
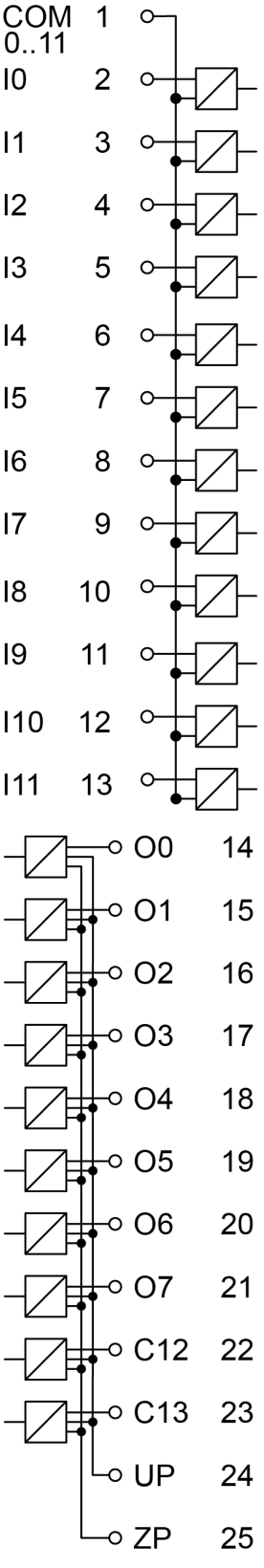
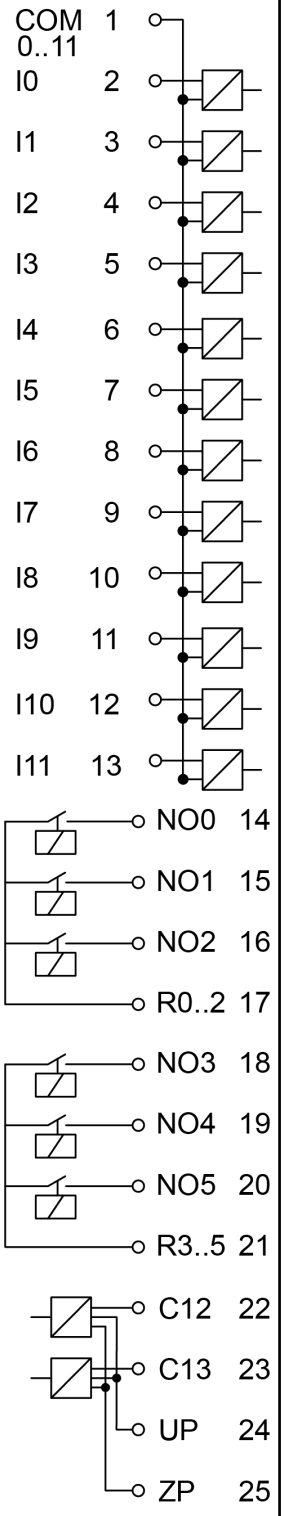
Table 48: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 49: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

84.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

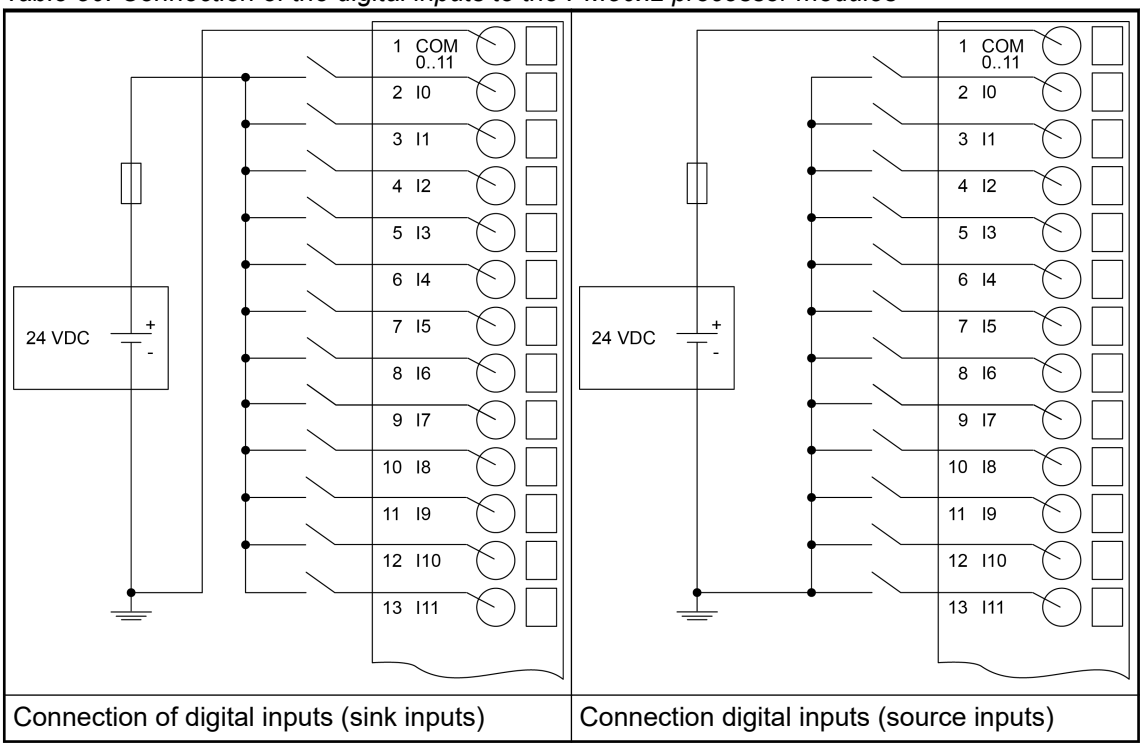
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 50: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

84.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

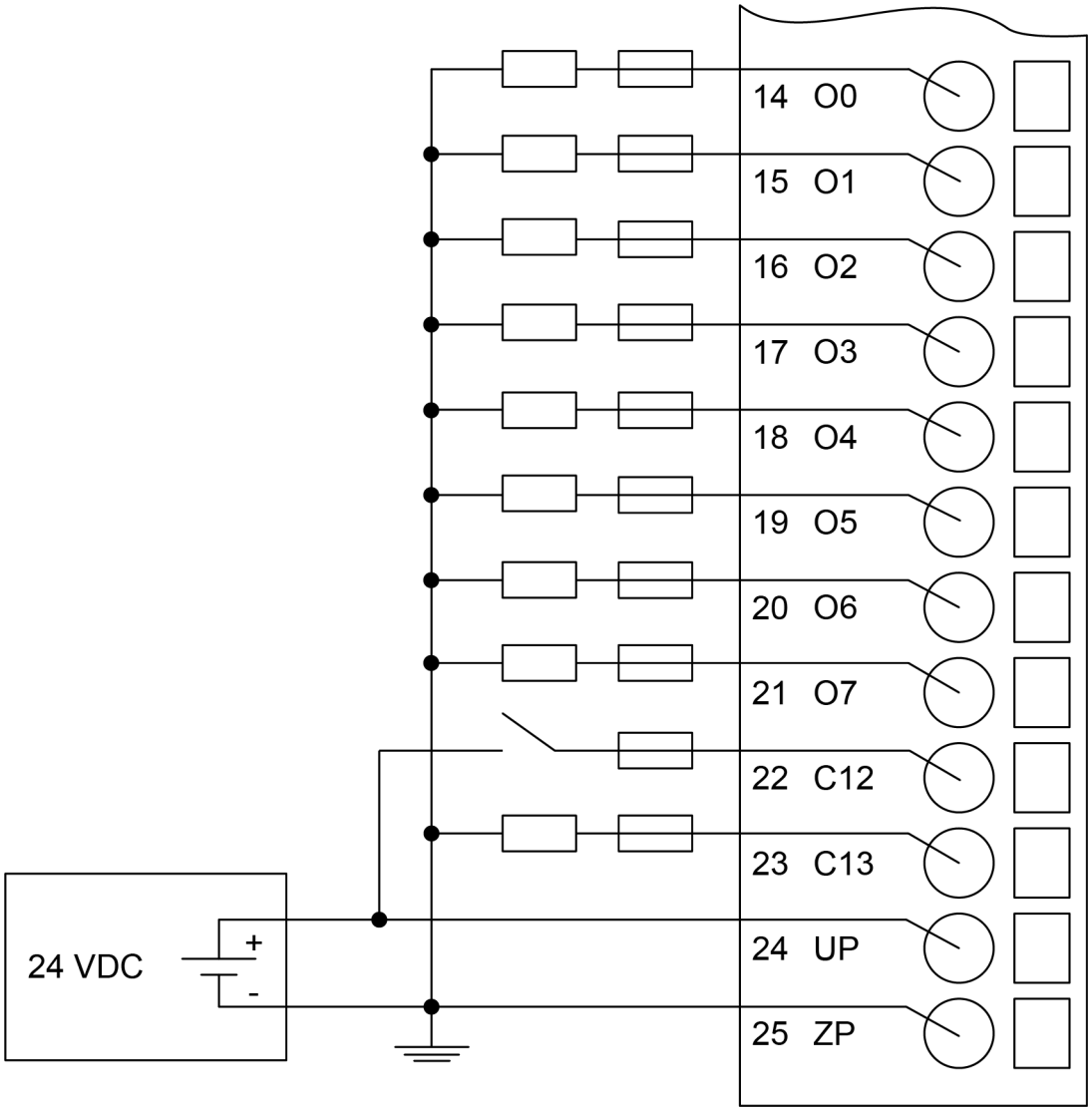


Fig. 142: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

84.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

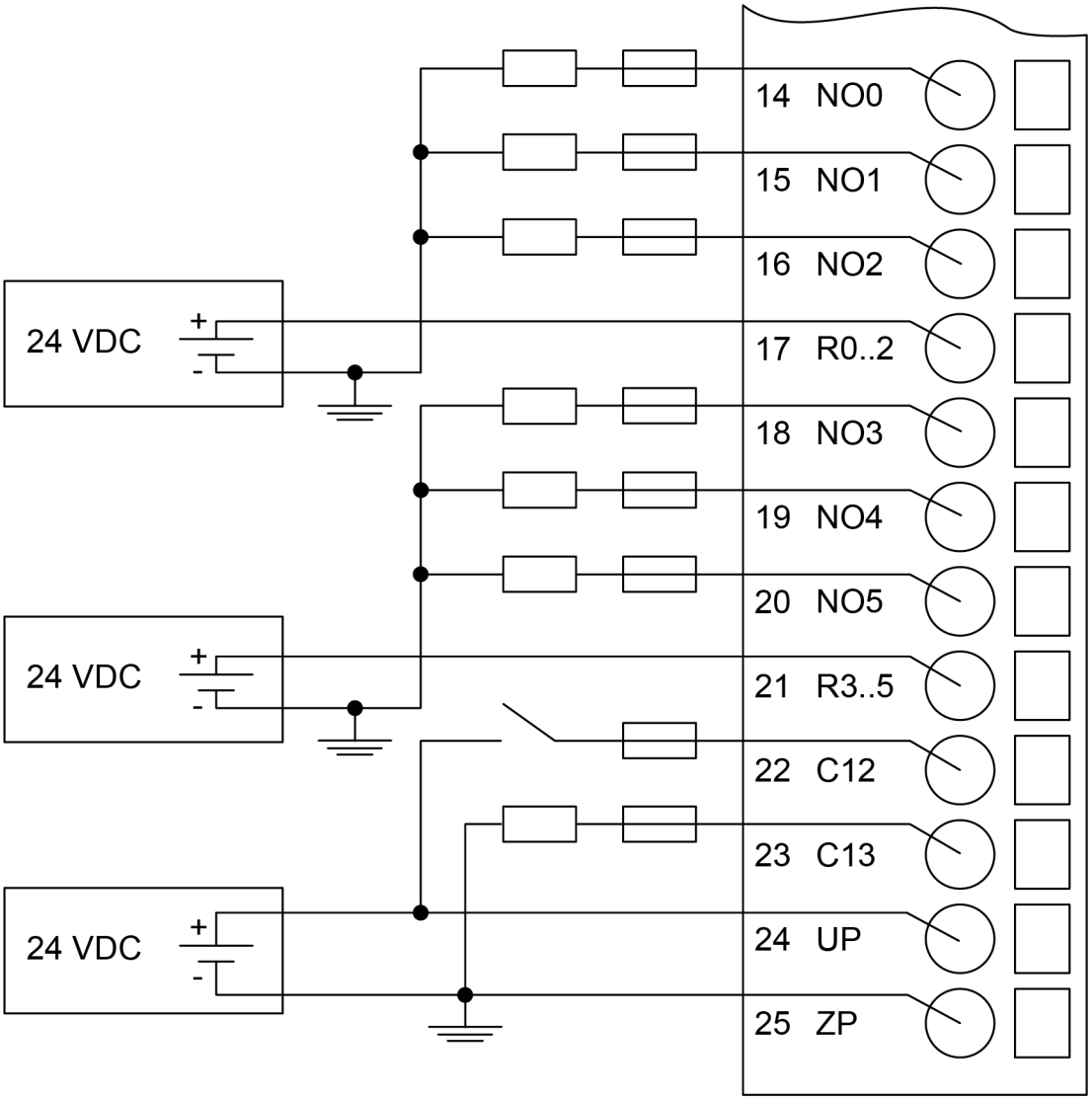


Fig. 143: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

84.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

85 PM5092-T-2ETH

- PM5092-T-2ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

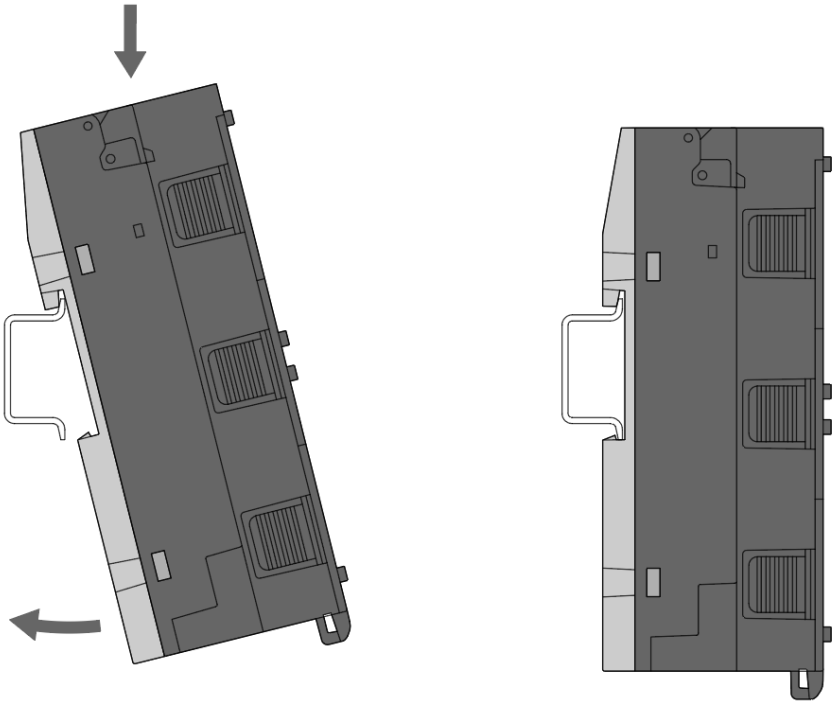
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

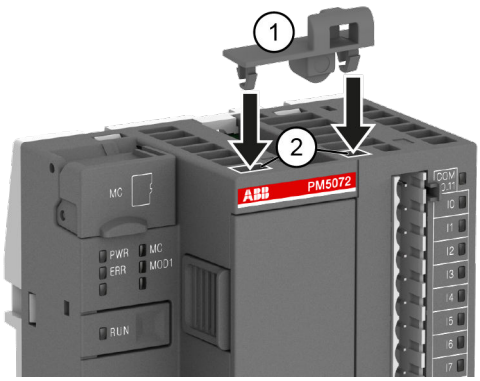
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

85.1 Assembly



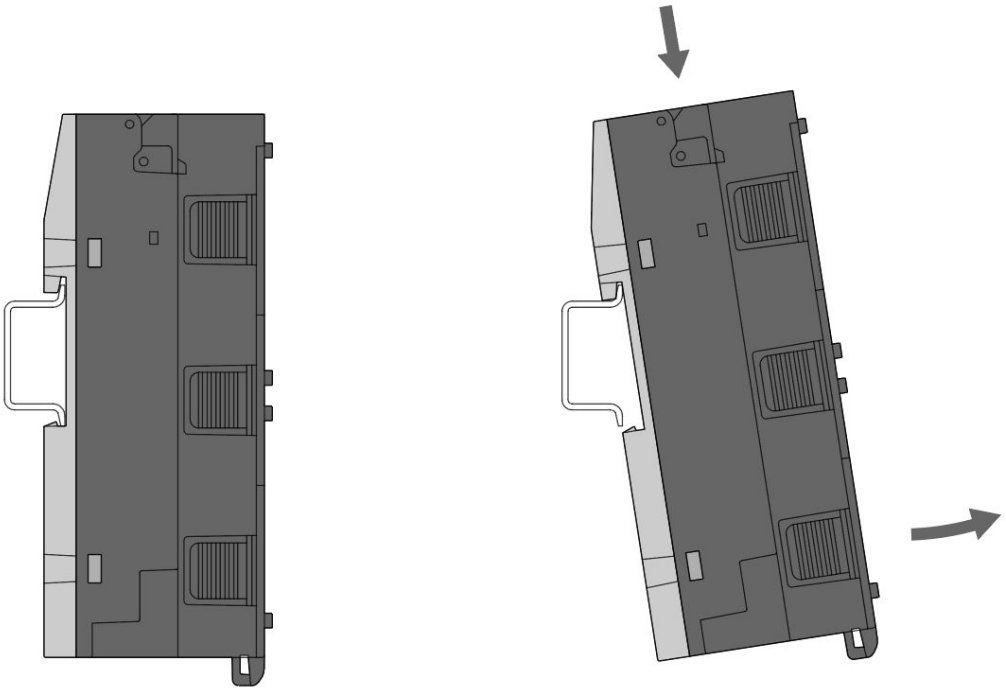
85.1.1 Assembly TA5301-CFA



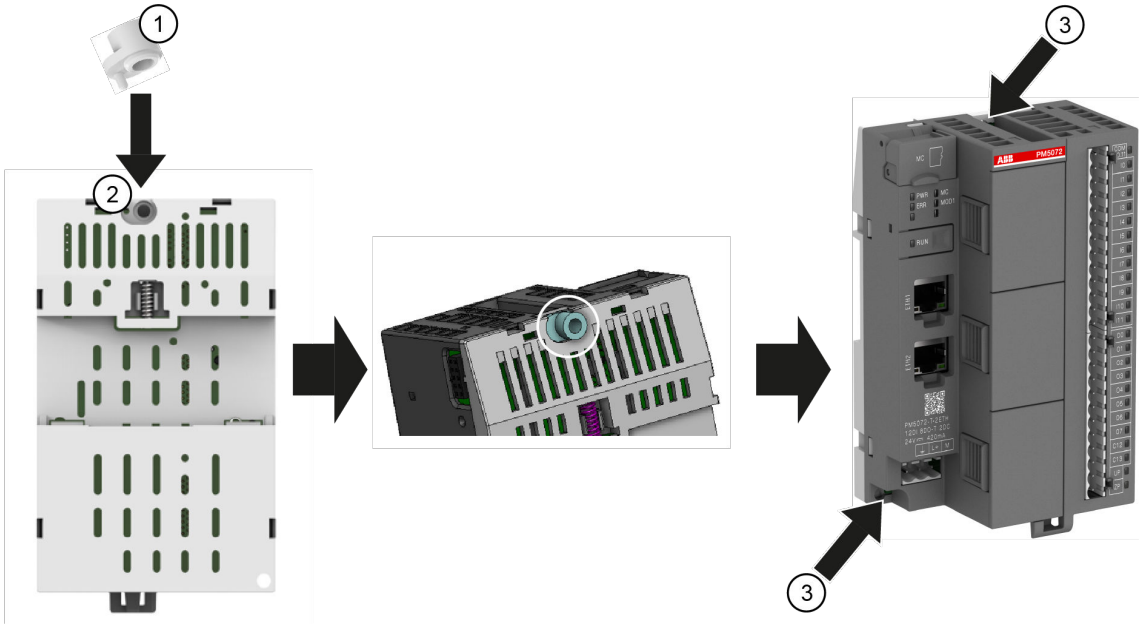
1 TA5301-CFA cable fixing accessory
2 2 openings on the PM50x2 processor module

▷ Insert the TA5301-CFA cable fixing accessory into the two openings on the PM50x2 processor module marked white in the figure.

85.2 Disassembly



85.3 Assembly with screws



1 TA543 screw mounting accessory
2 Slot for TA543 screw mounting accessory
3 2 holes for screw mounting

1. Insert the TA543 screw mounting accessory into the slot on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 2 screws (M4, max 1.2 Nm) from the front side.

⇨

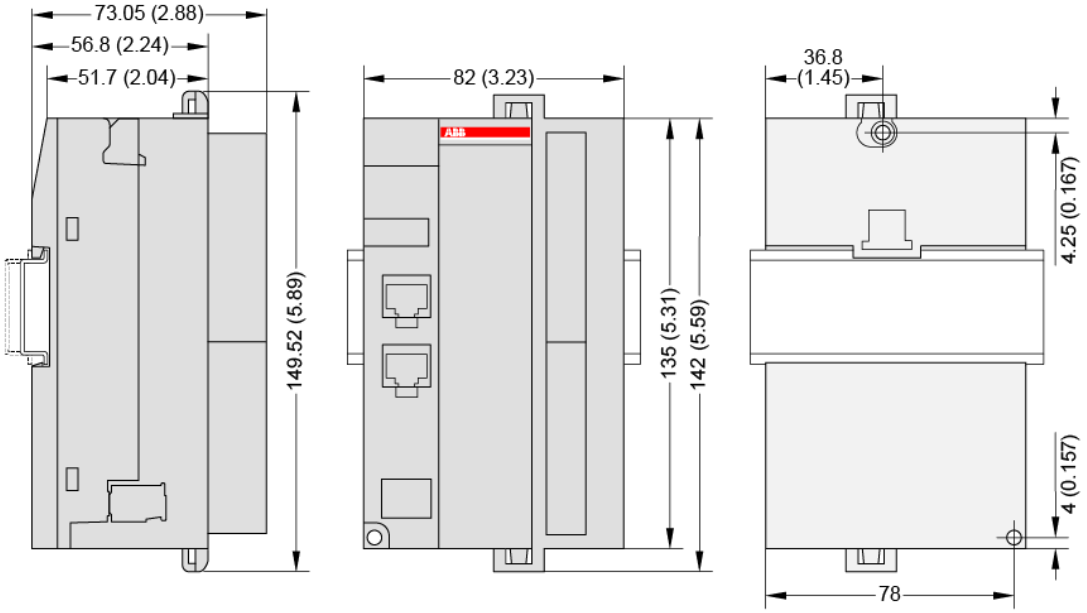
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

85.4 Dimensions



The dimensions are in mm and in brackets in inch.

85.5 Connections

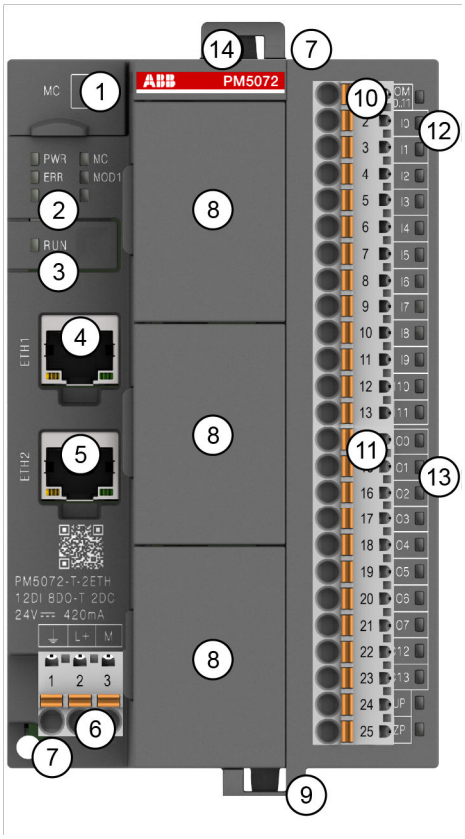


Fig. 144: Example: PM5072-T-2ETH

1 Micro memory card slot
2 5 LEDs to display the states of the processor module (Power, Error, Run, MC, MOD1)
3 RUN button
4 RJ45 female connector for Ethernet1 connection
5 RJ45 female connector for Ethernet2 connection (available for PM50x2-T-2ETH)
6 3-pin terminal block for power supply 24 V DC
7 2 holes for screw mounting
8 Option board slot cover for option board slot (the number of available slots varies according to the CPU type)
9 Cable fixing
10 13-pin terminal block for onboard I/Os
11 12-pin terminal block for onboard I/Os (not available on PM5012-x-ETH)
12 12 LEDs to display the states of the signals
13 10 LEDs to display the states of the signals
14 Cable fixing accessory TA5301-CFA on the top of the housing (optional)

The processor module is shown with pluggable terminal blocks. These terminal blocks must be ordered separately.

The cable fixing accessory on the top of the housing is optional.

Please use TA5301-CFA cable fixing accessory to provide strain relief.

It can also be used for AC500-eCo I/O modules.

The PM50x2 processor modules are supplied with option board slot covers as standard.

There are various TA51xx option boards for the processor modules that can be ordered separately.

Which and how many option boards can be plugged, depends on the respective processor module.

NOTICE!

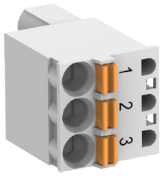
Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

85.5.1 Power supply

The processor modules PM50x2 can be connected to the 24 V DC supply voltage via a removable 3-pin spring terminal block or a 3-pin screw terminal block.

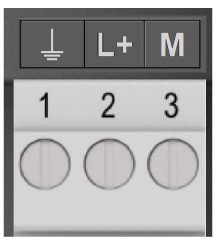
Table 51: Removable terminal block for the supply voltage 24 V DC

3-pin spring terminal block	3-pin screw terminal block
	

The terminal block is available as a set for AC500-eCo processor modules.

Basic CPU (PM5012)		**Standard CPUs (PM5032, PM5052) and Pro CPUs (PM5072, PM5082, PM5092)**	
Spring type	**Screw type**	**Spring type**	**Screw type**
TA5211-TSPF-B	TA5211-TSCL-B	TA5212-TSPF	TA5212-TSCL

Pin assignment

Pin Assignment	Pin	Label	Function	Description
 Terminal block inserted	1	⏚	FE	Functional earth
	2	L+	+24 V DC	Positive pin of the power supply voltage
	3	M	0 V	Negative pin of the power supply voltage

NOTICE!

Risk of damaging the PLC due to improper voltage levels!

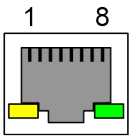
– Never exceed the maximum tolerance values for process and supply voltages.
– Never fall below the minimum tolerance values for process and supply voltages.

Observe the **system data** and the **technical data** of the used module.

85.5.2 Ethernet network interface(s)

The Ethernet interface is carried out via a RJ45 jack.

Table 52: Pin assignment of the Ethernet interface

Interface	Pin	Description	
	1	Tx+	Transmit data +
	2	Tx-	Transmit data -
	3	Rx+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	Rx-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

For PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH, shielded Cat 6 Ethernet cables must be used when the Ethernet interface is used for EtherCAT applications.

It is recommended to use cables with an outer shielding and shielded pairs.

85.5.3 Onboard I/Os

85.5.3.1 Connections

85.5.3.1.1 General

WARNING!

Risk of death by electric shock!

Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

NOTICE!

Risk of damaging the PLC modules!

The PLC modules must not be removed while the plant is connected to a power supply.

Make sure that all voltage sources (supply and process voltage) are switched off before you do the following:

– Connect or disconnect any signal or terminal block.
– Remove or replace a module.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

– Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.
– Never connect any voltages or signals to reserved terminals (marked with ---). Reserved terminals may carry internal voltages.

When replacing a processor module, it is recommended to mark each wire connected to the onboard I/O terminal block before disconnecting it. This should make sure that the wires can be reconnected in the same order.

The connection is carried out by using removable 12-pin and 13-pin terminal blocks.

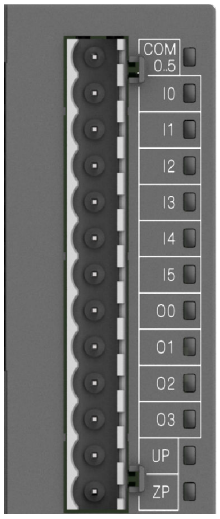


Table 53: Assignment of the terminals for PM5012-T-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	O0	Digital output signal O0 (5 kHz)
9	O1	Digital output signal O1 (5 kHz)
10	O2	Digital output signal O2 (5 kHz)
11	O3	Digital output signal O3 (5 kHz)
12	UP	Process supply voltage UP +24 V DC
13	ZP	Process supply voltage ZP 0 V DC

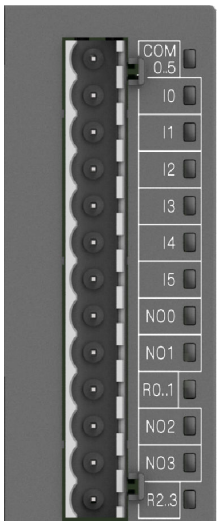


Table 54: Assignment of the terminals for PM5012-R-ETH:

Terminal	Signal	Description
1	COM 0..5	Input common for digital input signals I0 to I5
2	I0	Digital input signal I0 (5 kHz)
3	I1	Digital input signal I1 (5 kHz)
4	I2	Digital input signal I2 (5 kHz)
5	I3	Digital input signal I3 (5 kHz)
6	I4	Digital input signal I4 (5 kHz)
7	I5	Digital input signal I5 (5 kHz)
8	NO0	Normally-open relay contact of the output NO0
9	NO1	Normally-open relay contact of the output NO1
10	R0..1	Output common for signals NO0 to NO1
11	NO2	Normally-open relay contact of the output NO2
12	NO3	Normally-open relay contact of the output NO3
13	R2..3	Output common for signals NO2 to NO3

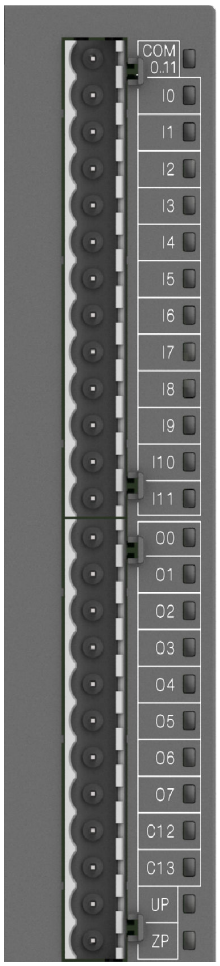


Table 55: Assignment of the terminals for PM5032-T-ETH, PM5052-T-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH and PM5092-T-2ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 (100 kHz) Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	O0	Digital output signal O0 (max. 5 kHz)
15	O1	Digital output signal O1 (max. 5 kHz)
16	O2	Digital output signal O2 (max. 5 kHz)

Terminal	Signal	Description
17	O3	Digital output signal O3 (max. 5 kHz)
18	O4	Digital output signal O4 PWM (max. 100 kHz), PTO (max. 200 kHz)
19	O5	Digital output signal O5 PWM (max. 100 kHz), PTO (max. 200 kHz)
20	O6	Digital output signal O6 PWM (max. 100 kHz), PTO (max. 200 kHz)
21	O7	Digital output signal O7 PWM (max. 100 kHz), PTO (max. 200 kHz)
22	C12	Digital input/output signal configurable C12
23	C13	Digital input/output signal configurable C13
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

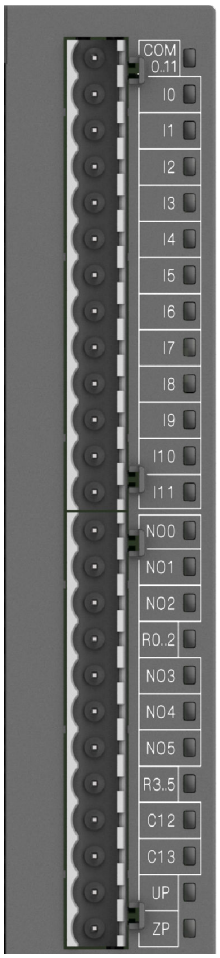


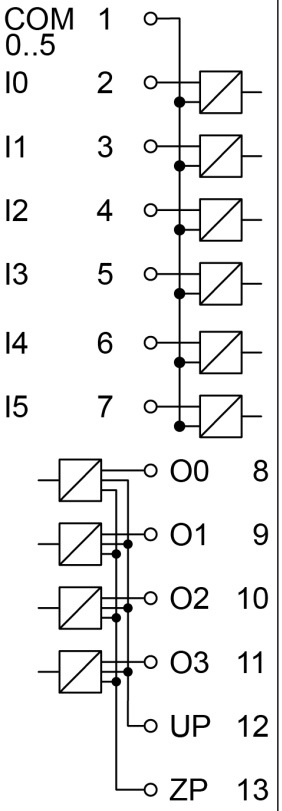
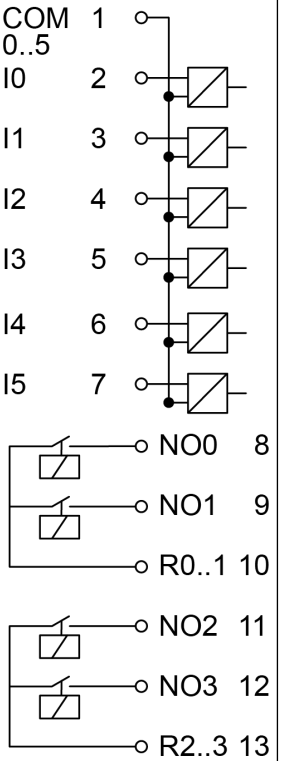
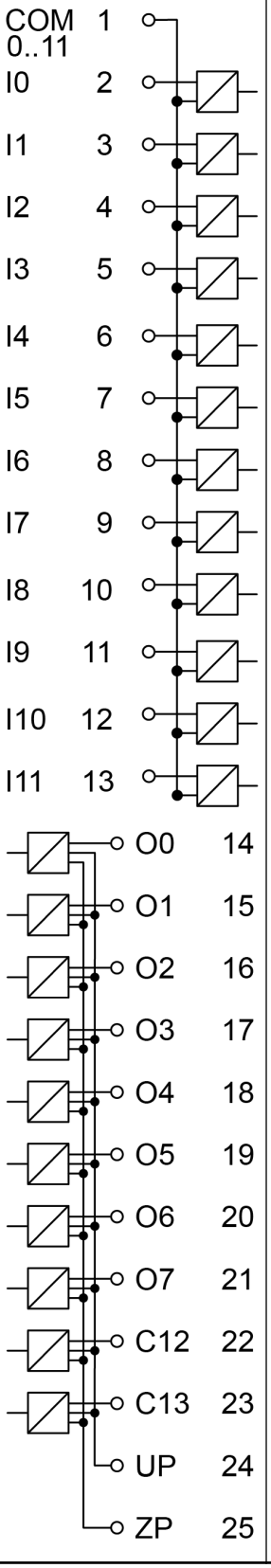
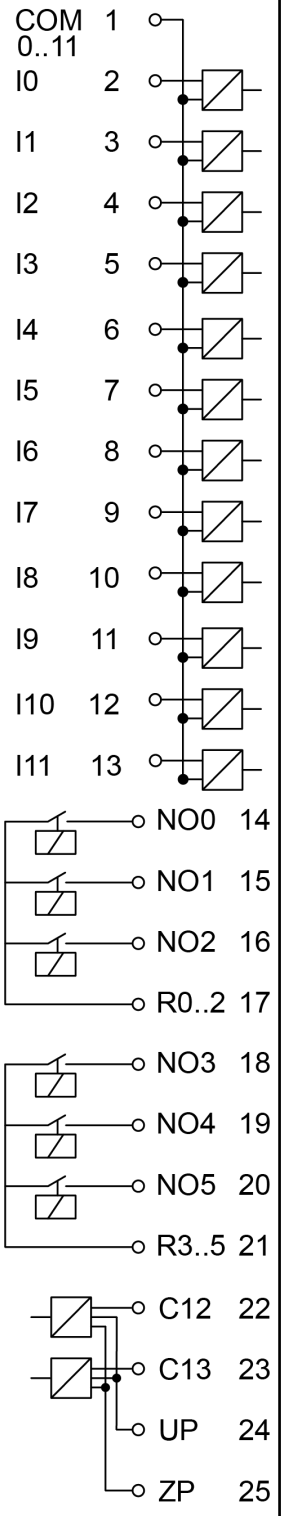
Table 56: Assignment of the terminals for PM5032-R-ETH and PM5052-R-ETH:

Terminal	Signal	Description
1	COM 0..11	Input common for digital input signals I0 to I11
2	I0	Digital input signal I0 (max. 5 kHz)
3	I1	Digital input signal I1 (max. 5 kHz)
4	I2	Digital input signal I2 (max. 5 kHz)
5	I3	Digital input signal I3 (max. 5 kHz)
6	I4	Digital input signal I4 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
7	I5	Digital input signal I5 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
8	I6	Digital input signal I6 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
9	I7	Digital input signal I7 Forward counter (max. 100 kHz), Encoder (max. 200 kHz)
10	I8	Digital input signal I8
11	I9	Digital input signal I9
12	I10	Digital input signal I10
13	I11	Digital input signal I11
14	NO0	Normally-open relay contact of the output NO0
15	NO1	Normally-open relay contact of the output NO1
16	NO2	Normally-open relay contact of the output NO2
17	R0..2	Output common for signals NO0 to NO2
18	NO3	Normally-open relay contact of the output NO3

Terminal	Signal	Description
19	NO4	Normally-open relay contact of the output NO4
20	NO5	Normally-open relay contact of the output NO5
21	R3..5	Output common for signals NO3 to NO5
22	C12	Digital input/output signal configurable C12 PWM (max. 100 kHz), PTO (max. 200 kHz)
23	C13	Digital input/output signal configurable C13 PWM (max. 100 kHz), PTO (max. 200 kHz)
24	UP	Process supply voltage UP +24 V DC
25	ZP	Process supply voltage ZP 0 V DC

Block diagrams

Table 57: Internal structure of the onboard I/Os

PM5012-T-ETH	PM5012-R-ETH	PM5032-ETH PM5052-T-ETH PM5072-T-2ETH(W) PM5082-T-2ETH PM5092-T-2ETH	PM5032-R-ETH PM5052-R-ETH
			

85.5.3.1.2 Connection of the digital inputs

The digital inputs can be used as source inputs or as sink inputs.

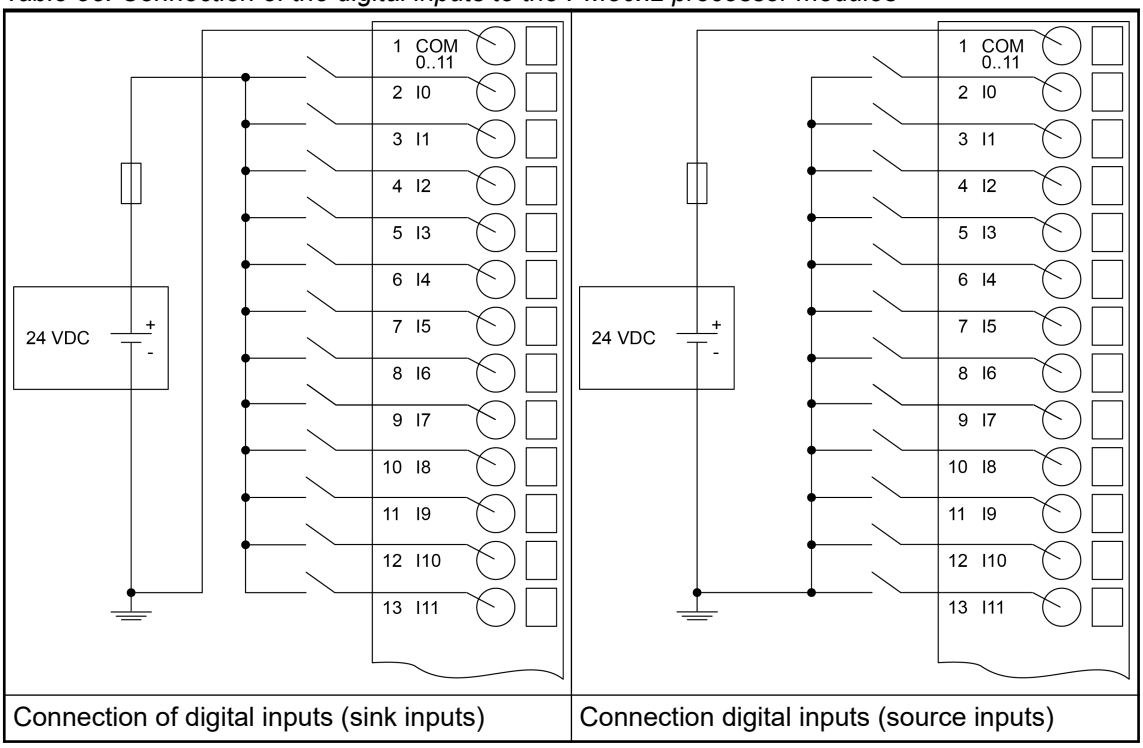
NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

Table 58: Connection of the digital inputs to the PM50x2 processor modules



Connection of digital inputs (sink inputs)	Connection digital inputs (source inputs)

85.5.3.1.3 Connection of the digital transistor outputs (PM50xx-T-xETH only)

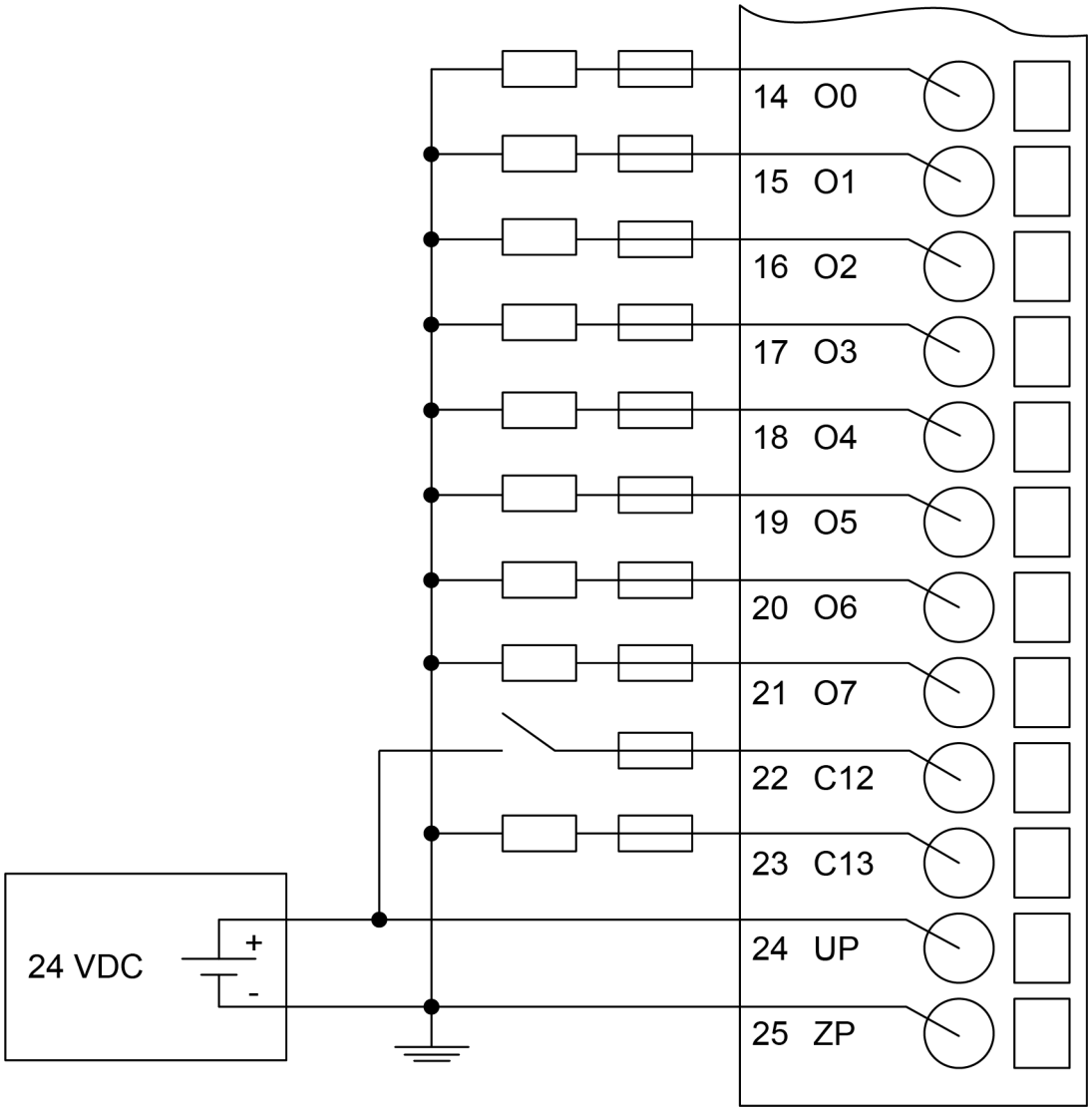


Fig. 145: Connection of digital transistor outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

CAUTION!
Risk of damaging the processor module!
The outputs are not protected against short circuit and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

85.5.3.1.4 Connection of the digital relay outputs (PM50xx-R-ETH only)

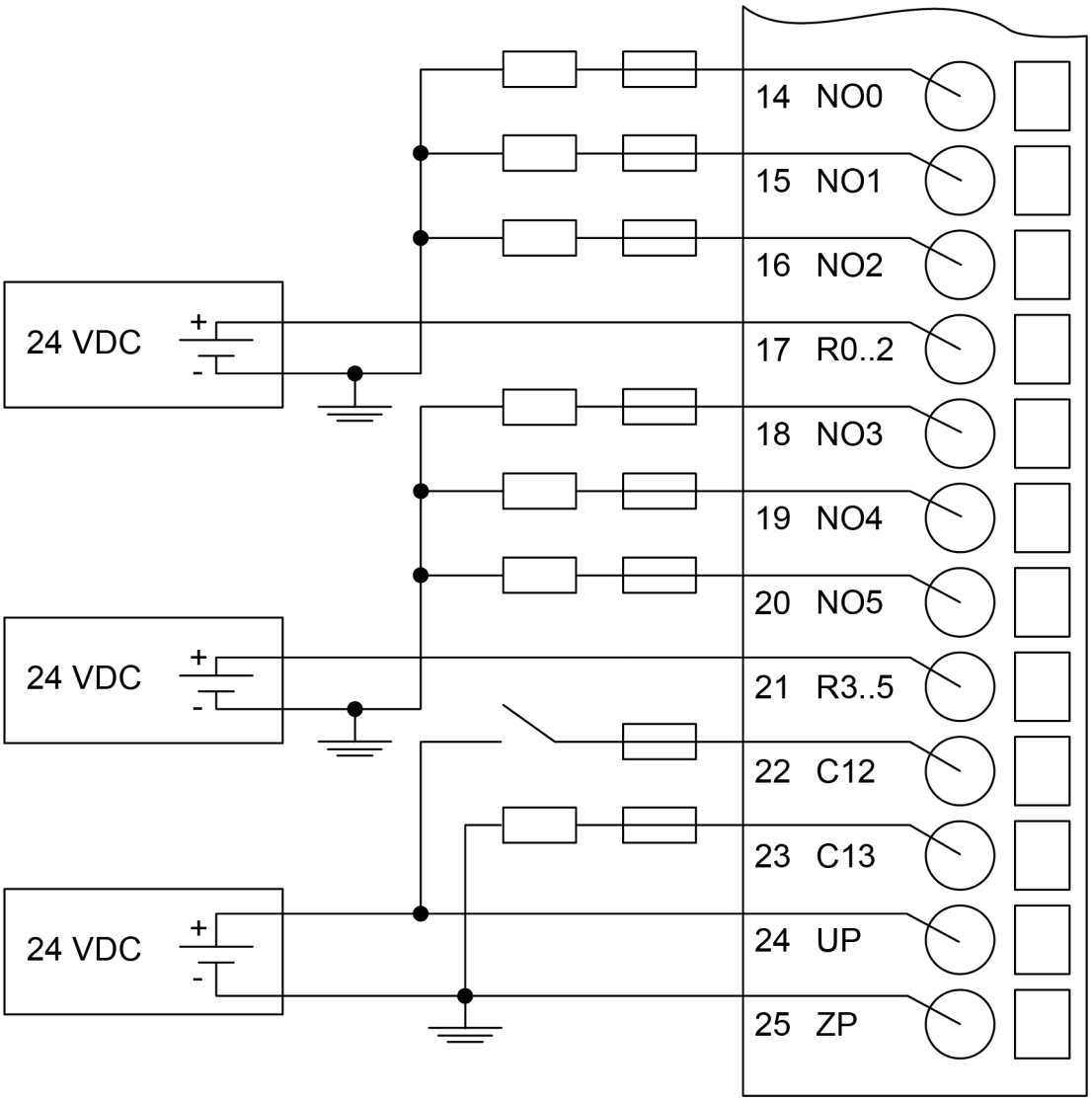


Fig. 146: Connection of digital relay outputs and configurable digital inputs/outputs

C12 used as configurable digital input
C13 used as configurable digital transistor output

WARNING!
Risk of death by electric shock!
Hazardous voltages can be present at the terminals of the module.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

CAUTION!
Risk of damaging the processor module!
- Never short-circuit or overload the outputs.
- Never connect inductive loads without an external suppression against voltage peaks due to inductive kickback.
- Never connect voltages > 240 V. All outputs must be fed from the same phase.
- Use an external fuse for each output.

The configurable digital channels (C12 and C13) used as digital inputs have the same electrical characteristics as standard digital inputs.

The configurable digital channels (C12 and C13) used as digital transistor outputs have the same electrical characteristics as standard digital outputs.

85.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
PM50x2 with TA521x-TSCL-X	7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2
PM50x2 with TA521x-TSPF-X	11 mm	X	-	0.6 x 3.5 mm	0.5 - 2.5 mm^2

86 PM5630-2ETH(-XC)

- PM5630-2ETH
- PM5630-2ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 59: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	**PM5630**	**PM5650**	**PM5670**	**PM5675**	**PM5680** [2)]	**PM5685** [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

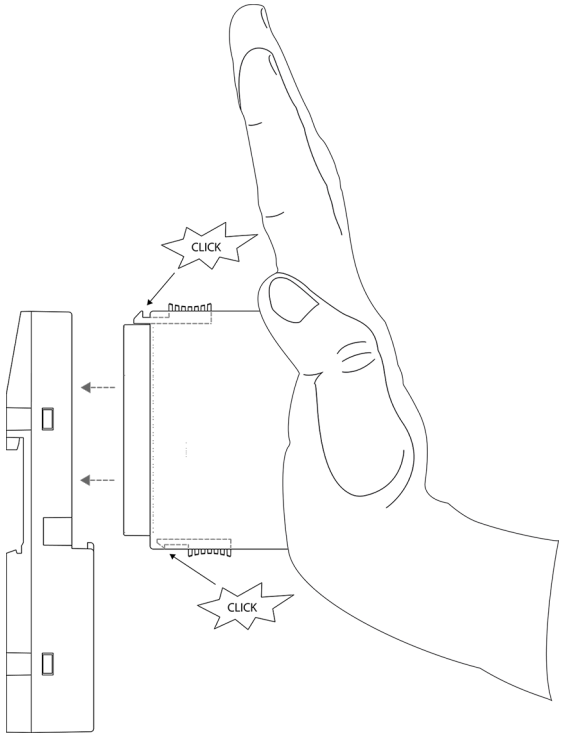
Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

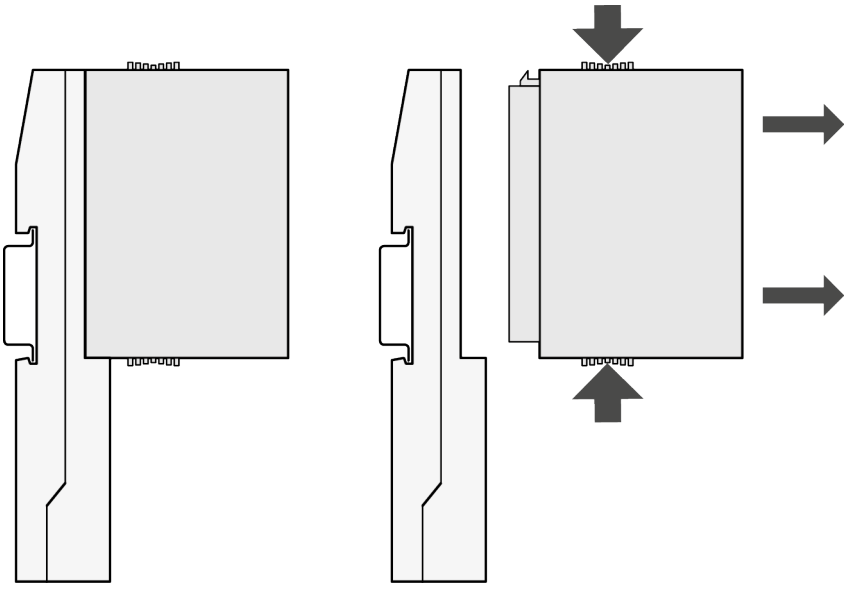
[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

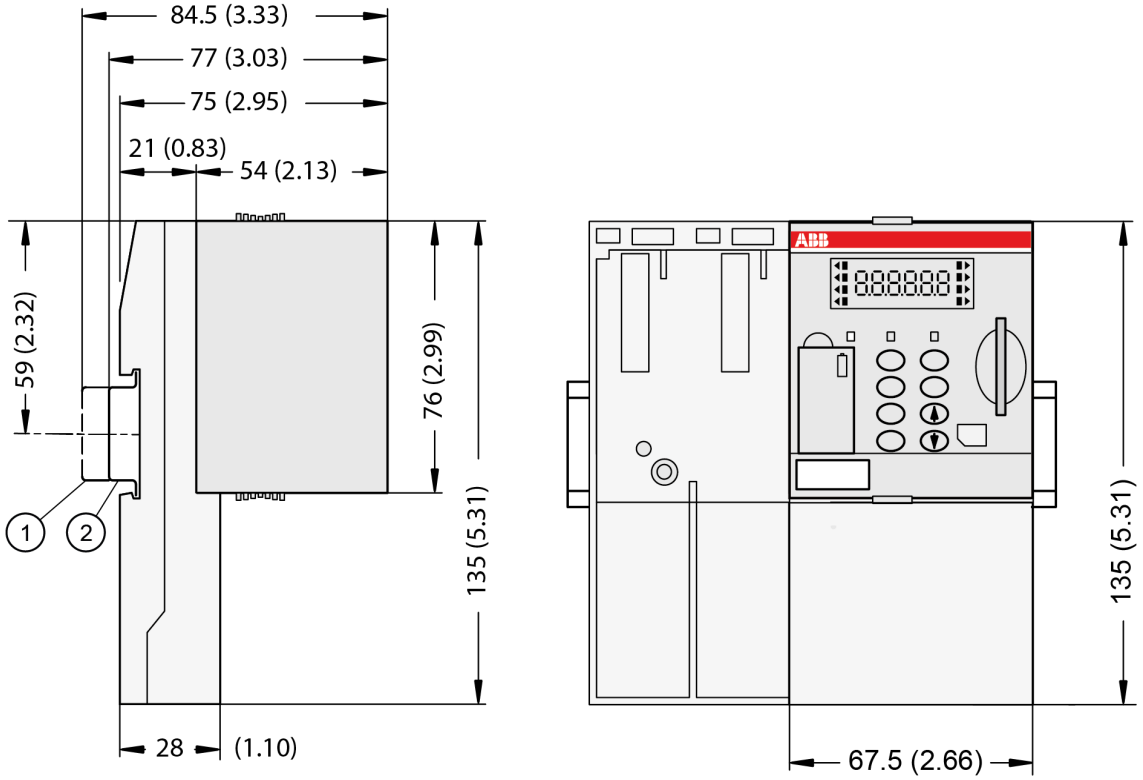
86.1 Assembly



86.2 Disassembly



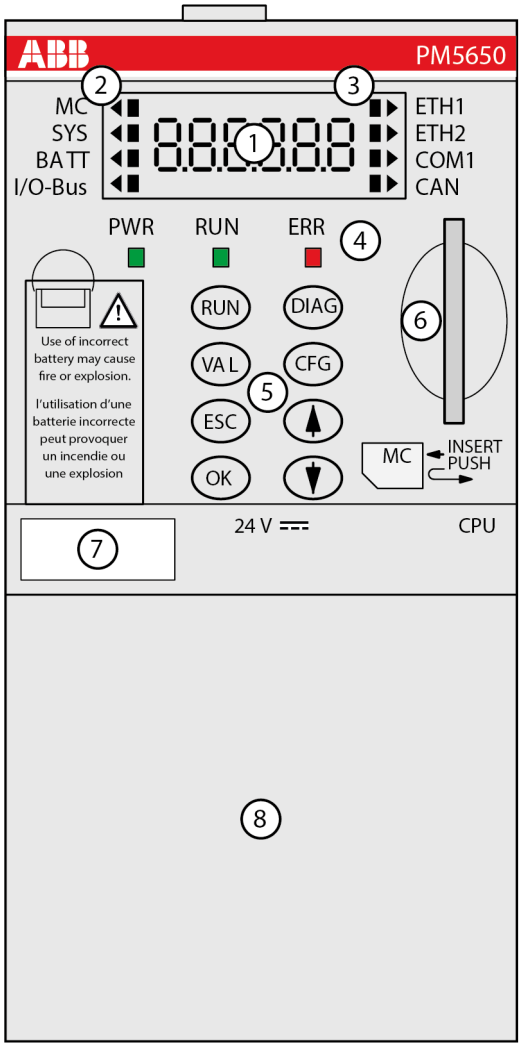
86.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

86.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

> *Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.*

Table 60: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

87 PM5650-2ETH(-XC)

- PM5650-2ETH
- PM5650-2ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 61: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	**PM5630**	**PM5650**	**PM5670**	**PM5675**	**PM5680** [2)]	**PM5685** [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

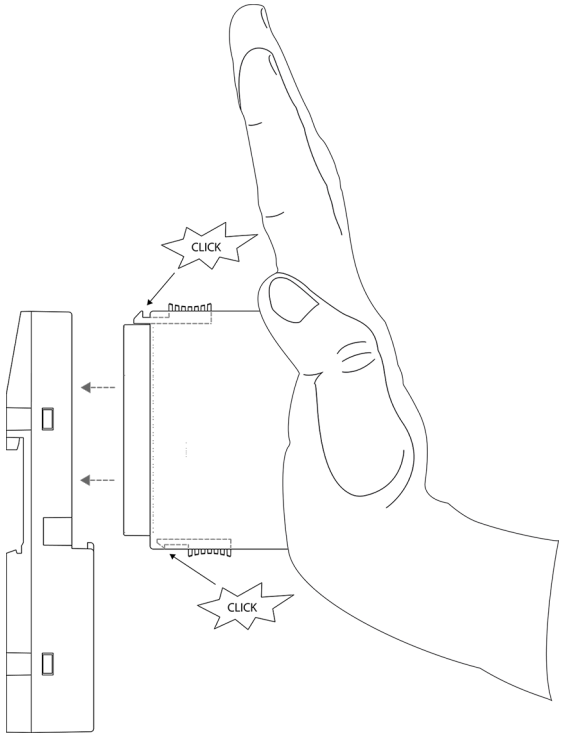
Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

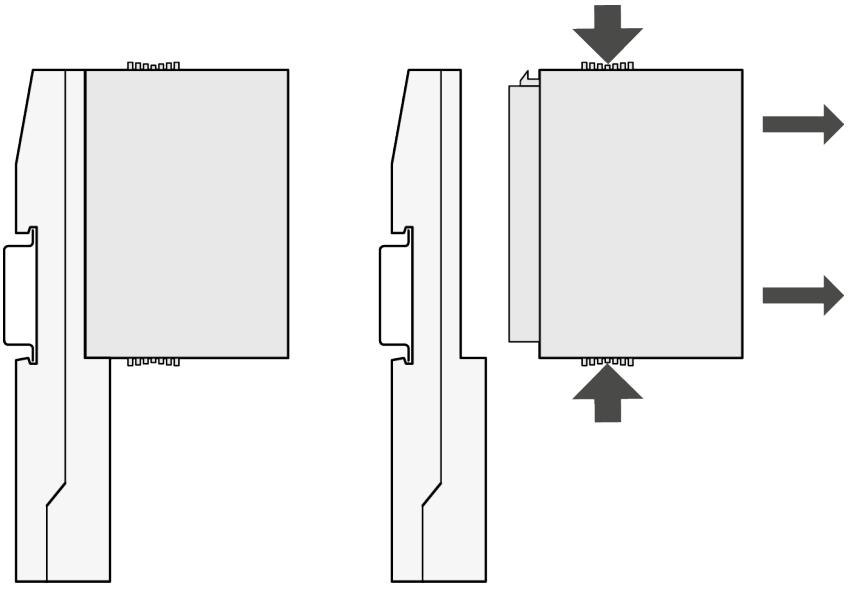
[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

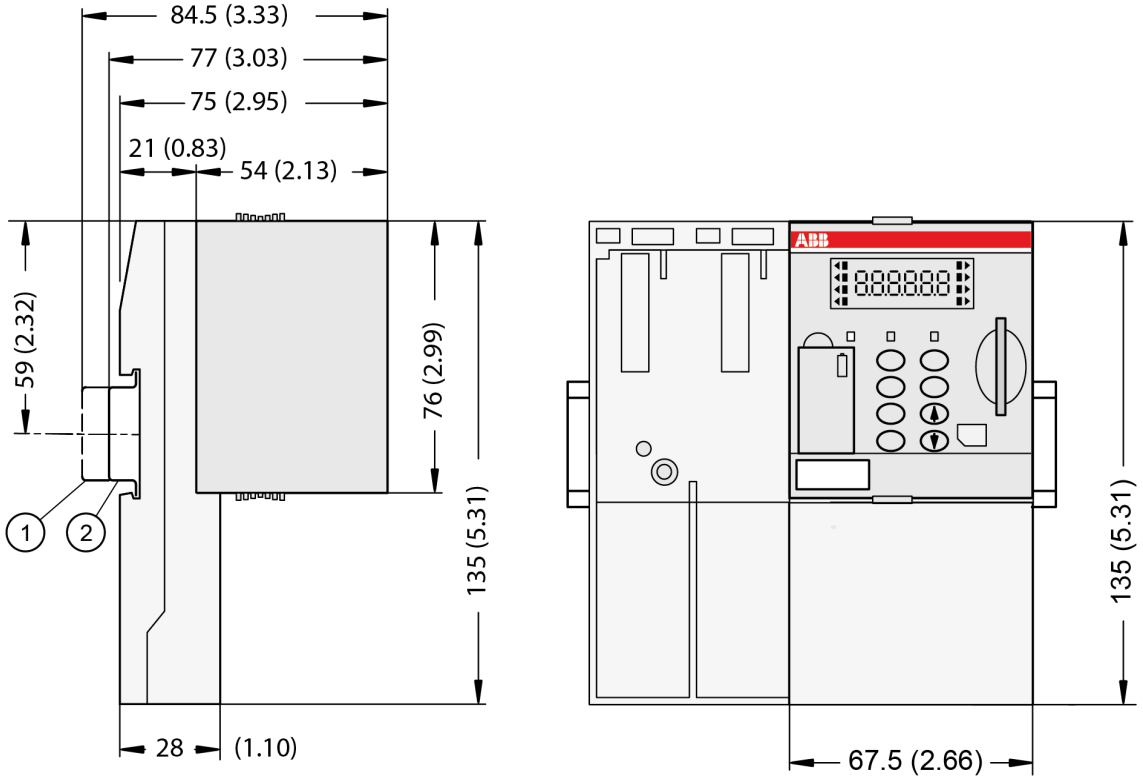
87.1 Assembly



87.2 Disassembly



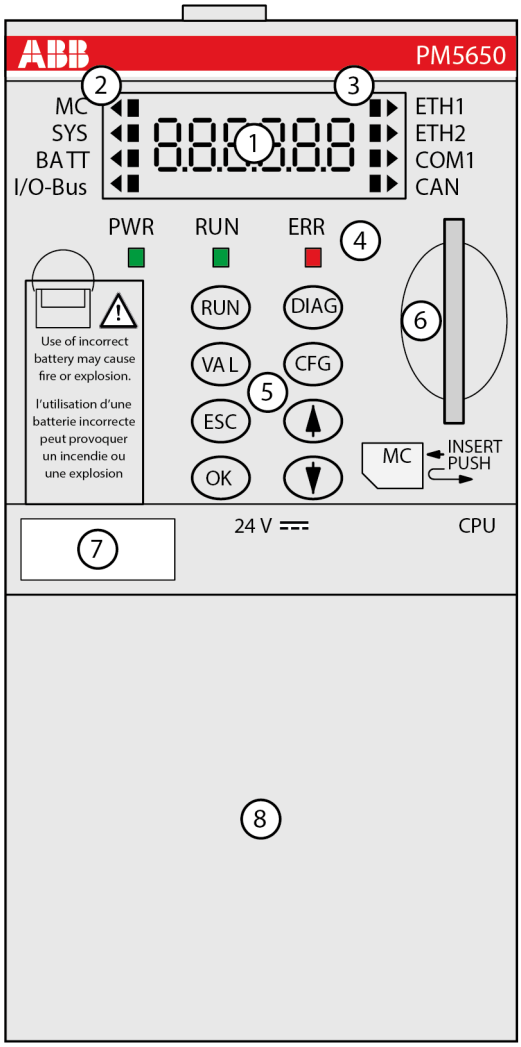
87.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

87.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

> *Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.*

Table 62: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

88 PM5670-2ETH(-XC)

- PM5670-2ETH
- PM5670-2ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 63: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

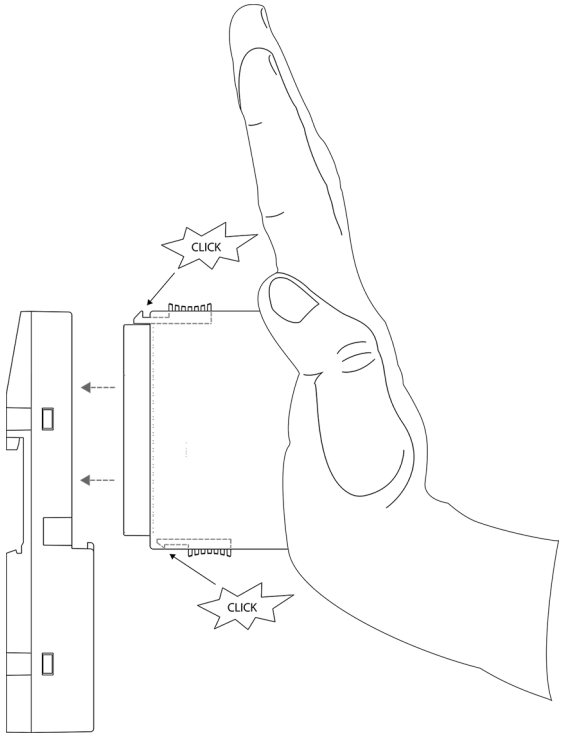
Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

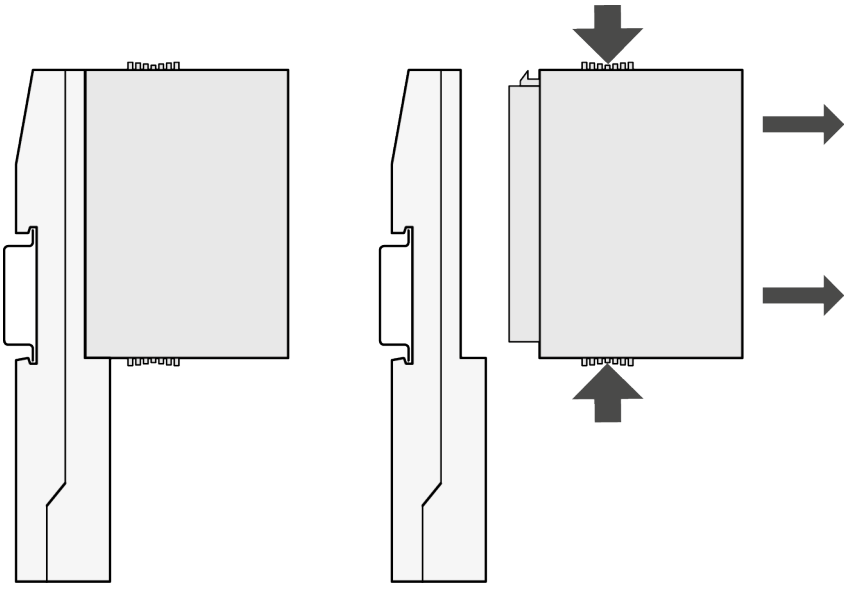
[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

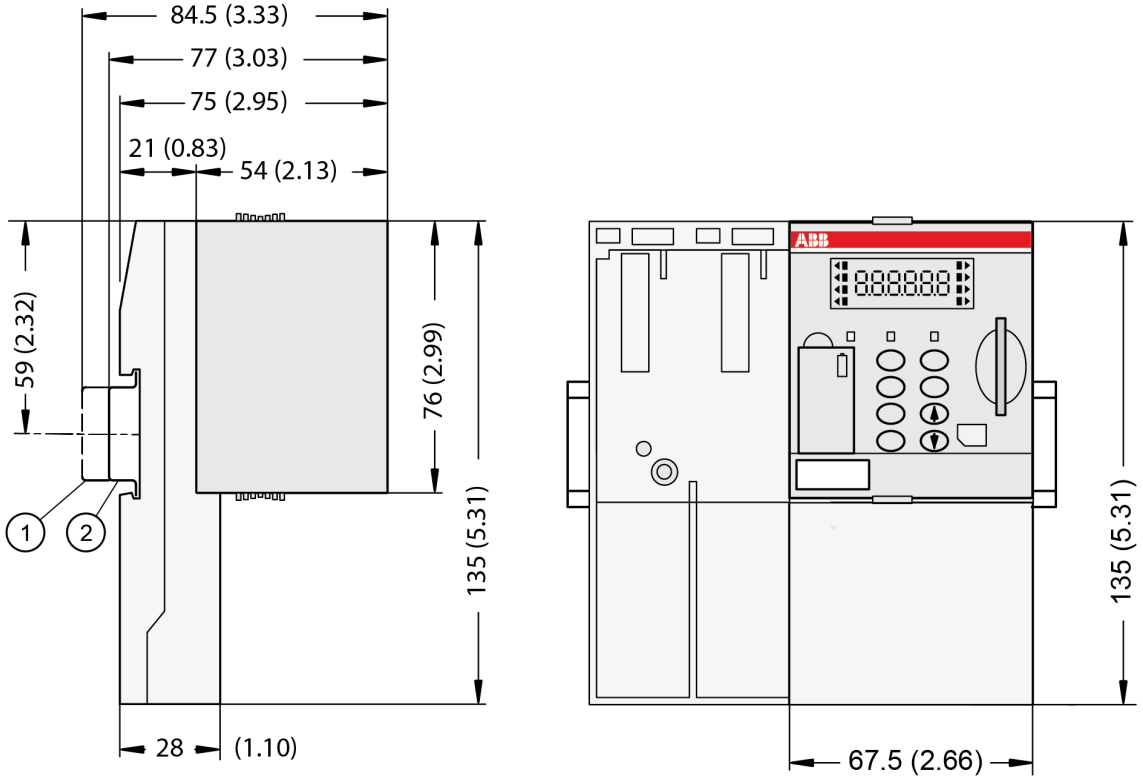
88.1 Assembly



88.2 Disassembly



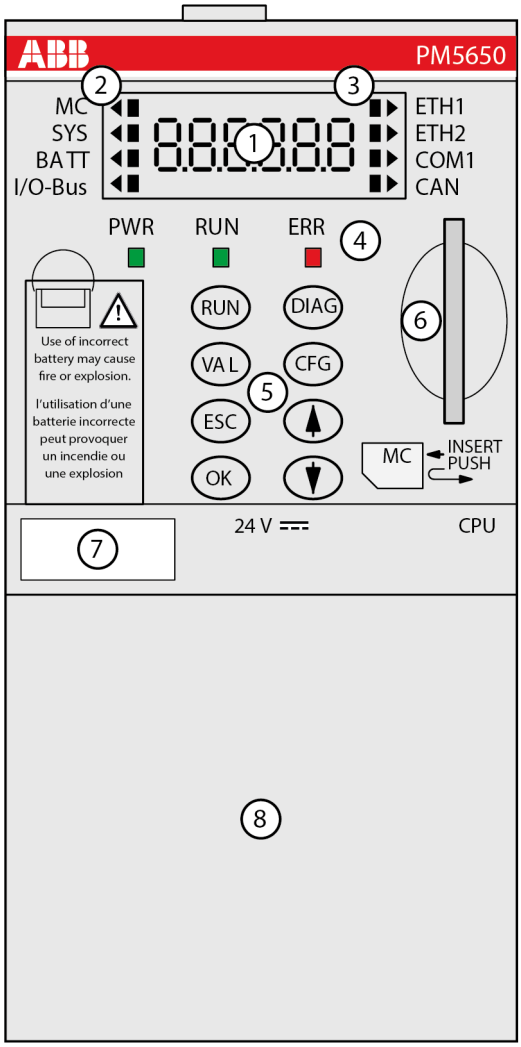
88.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

88.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

> *Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.*

Table 64: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

89 PM5675-2ETH(-XC)

- PM5675-2ETH
- PM5675-2ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 65: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

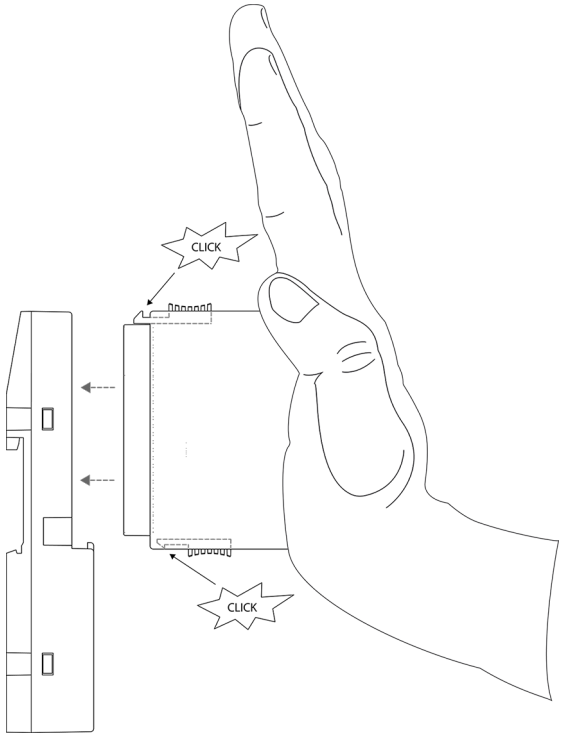
Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

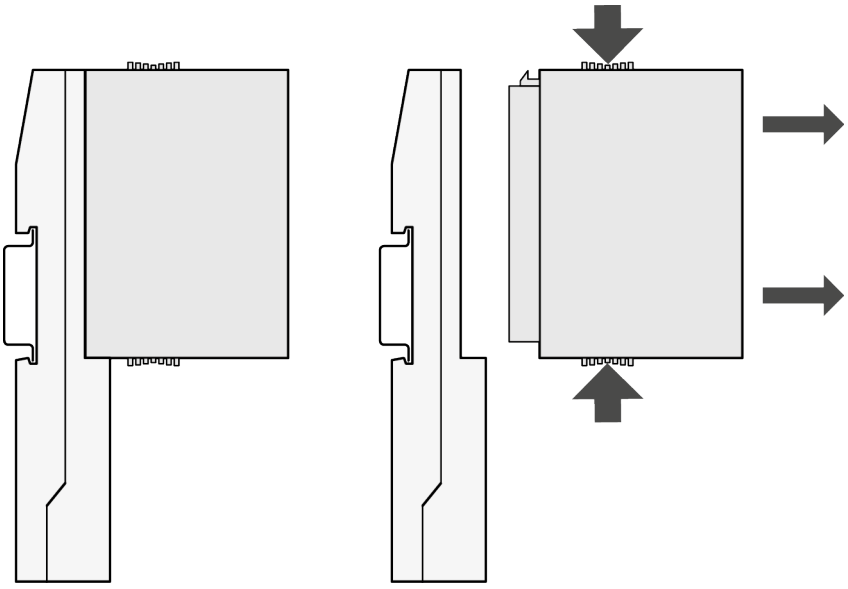
[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

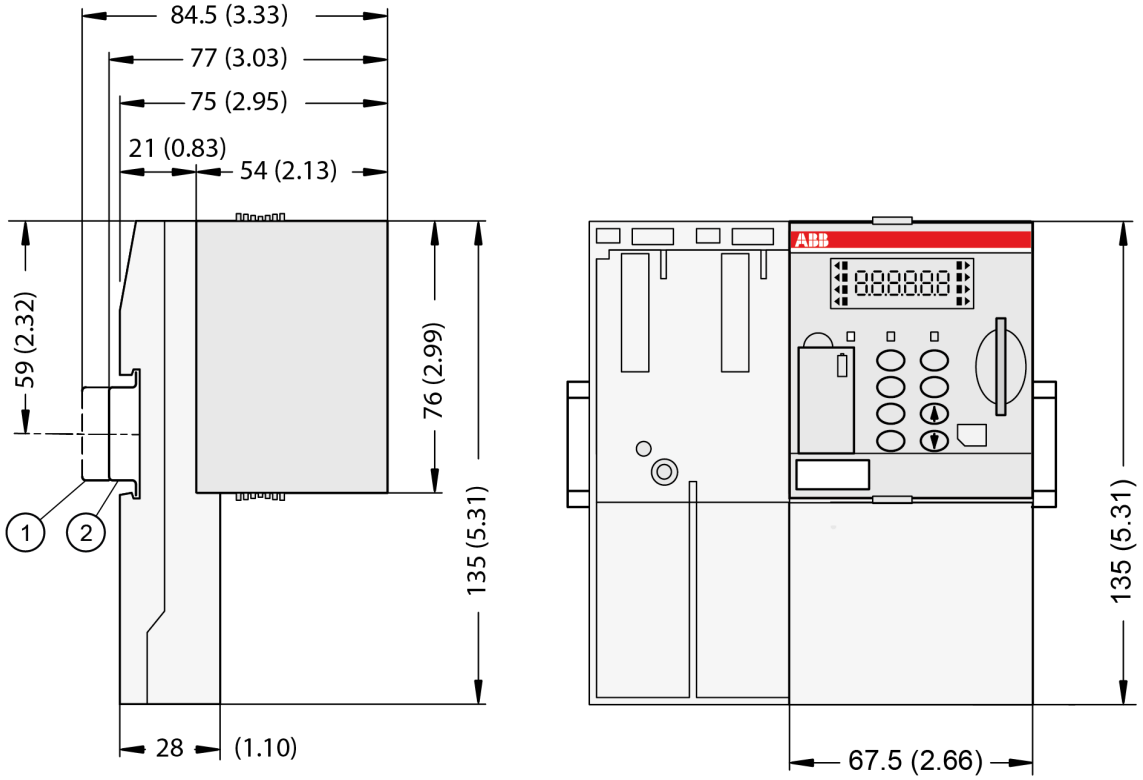
89.1 Assembly



89.2 Disassembly



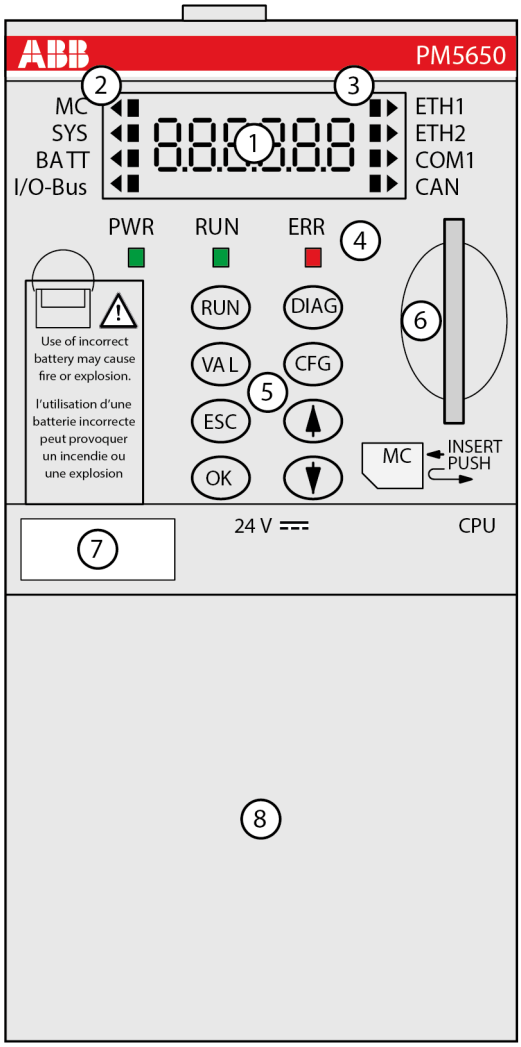
89.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

89.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

> *Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.*

Table 66: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2)]	PM5685 [2)]
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2)] XC variant is not applicable.

90 PM5680-2ETH

- PM5680-2ETH



CAUTION!

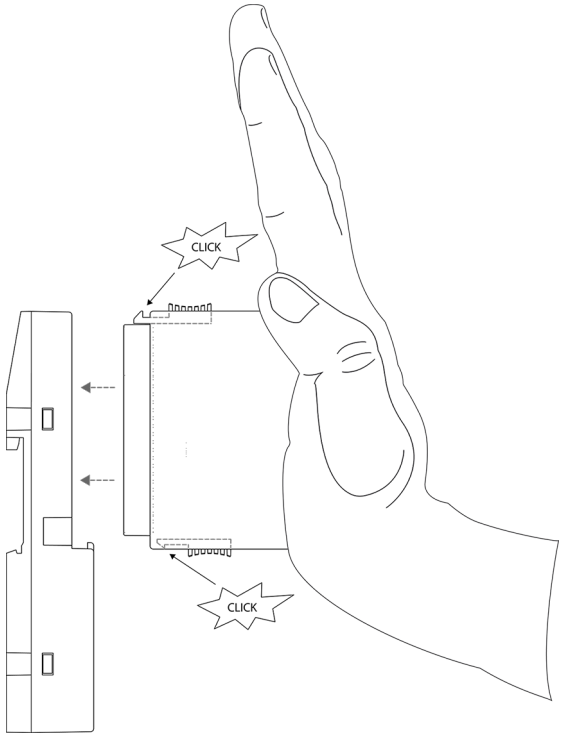
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

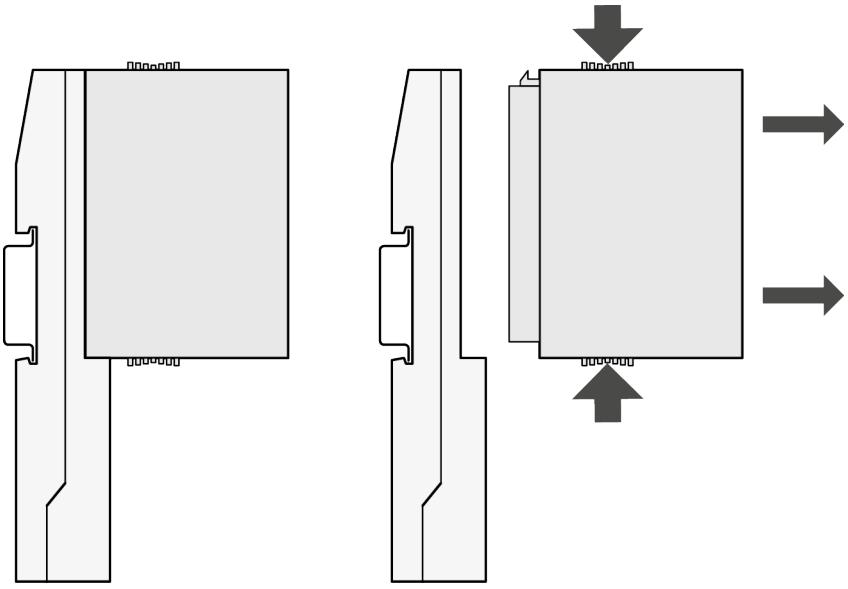
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

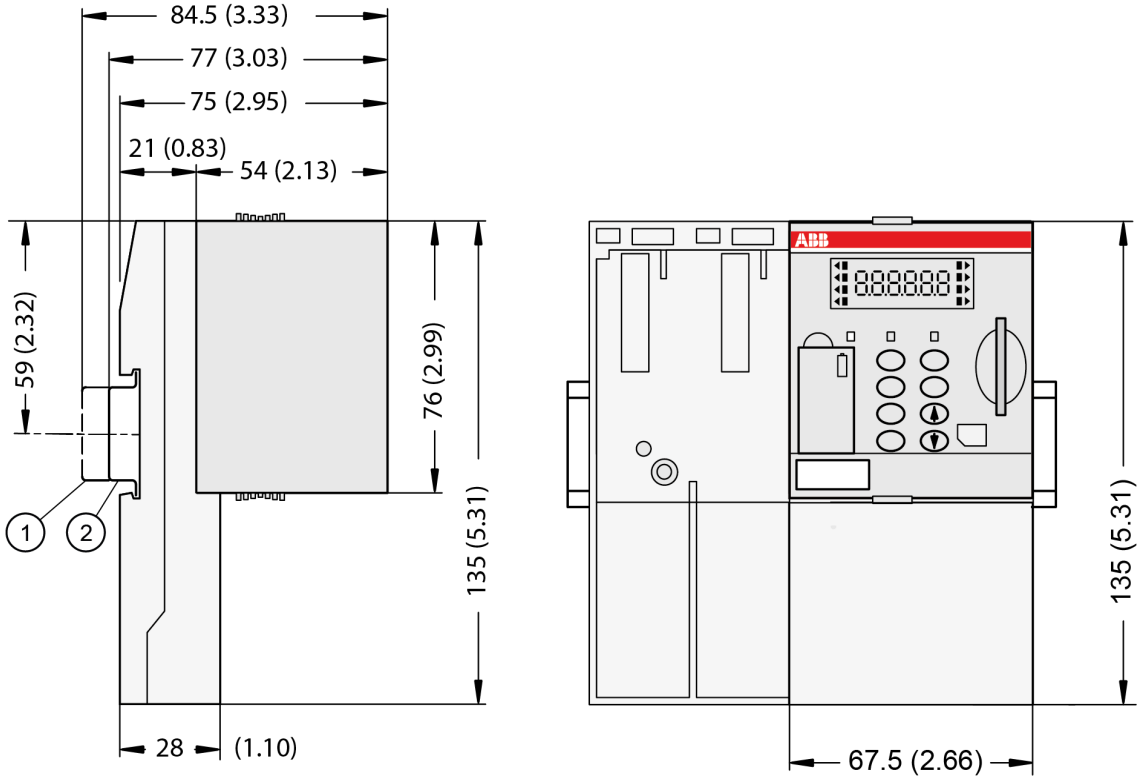
90.1 Assembly



90.2 Disassembly



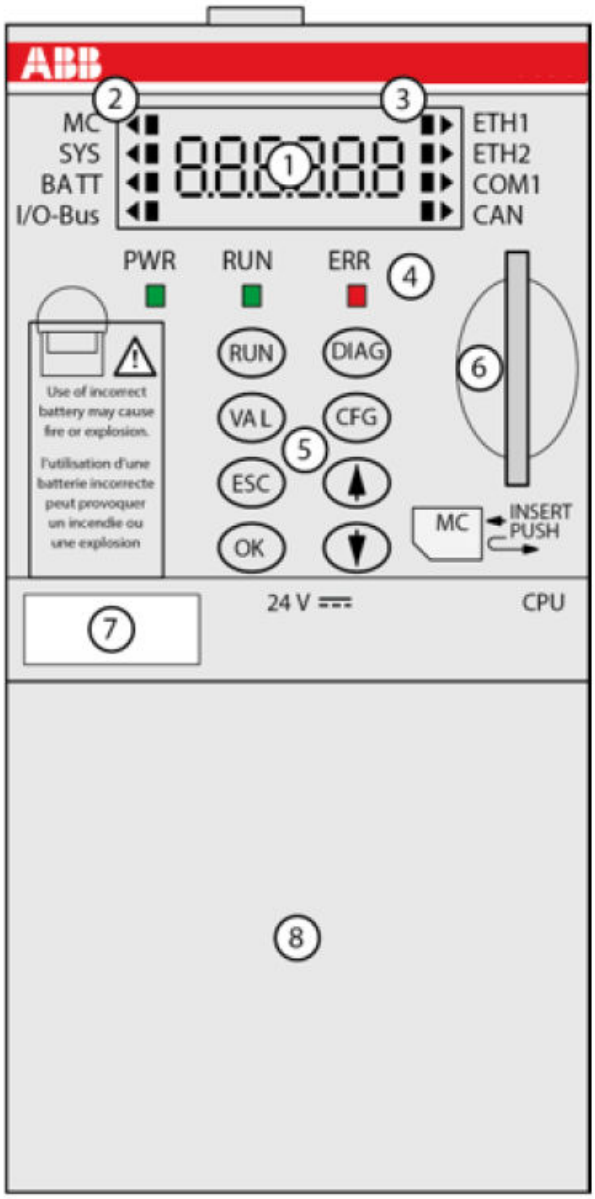
90.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

90.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 67: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680	PM5685
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

91 PM5685-2ETH

- PM5685-2ETH



CAUTION!

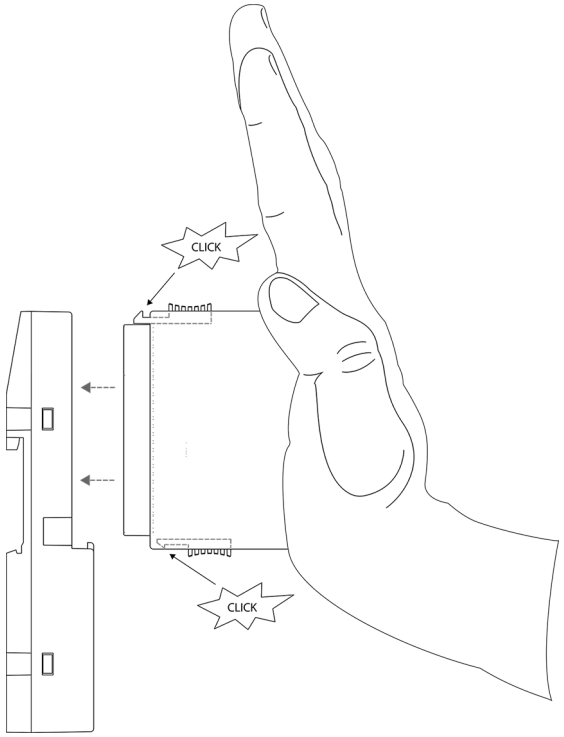
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

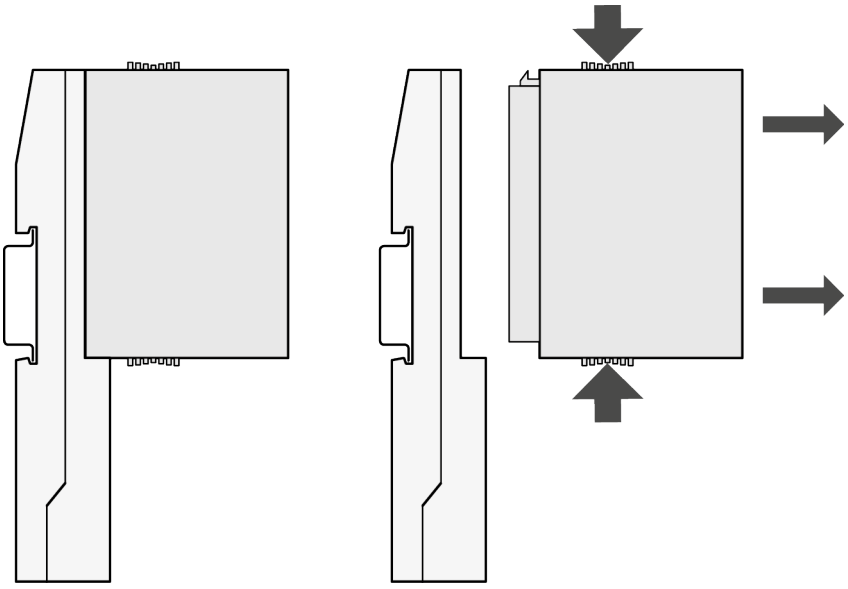
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

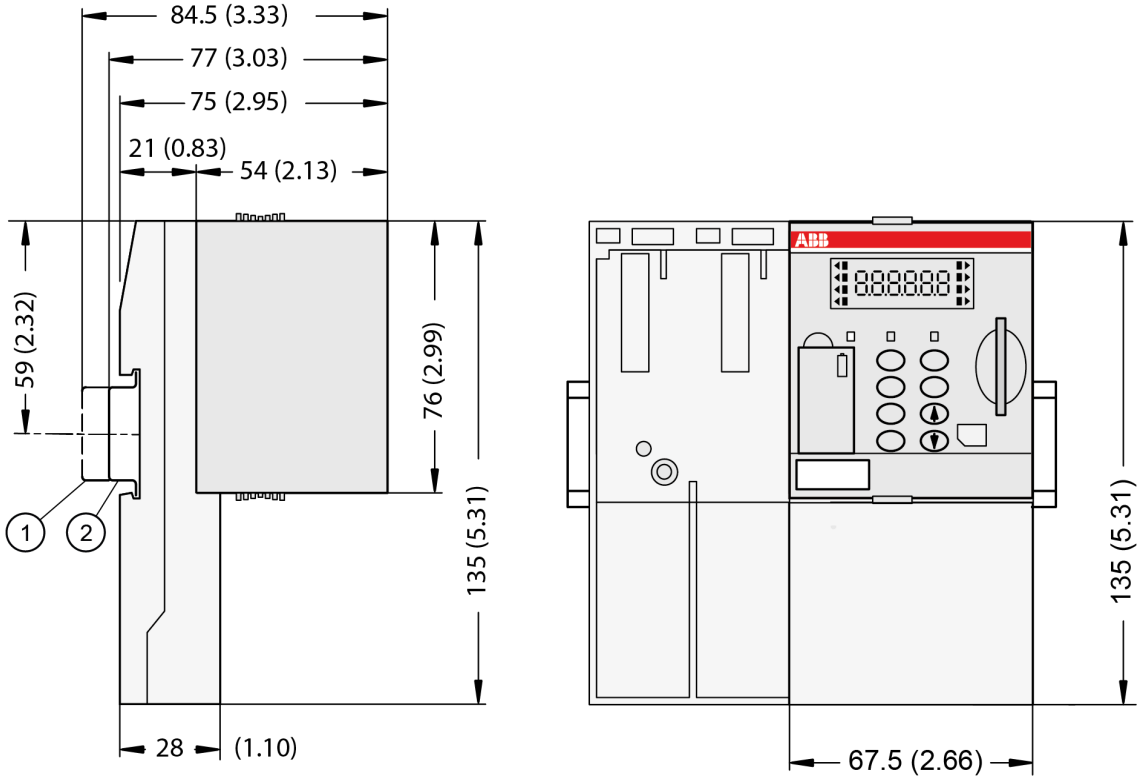
91.1 Assembly



91.2 Disassembly



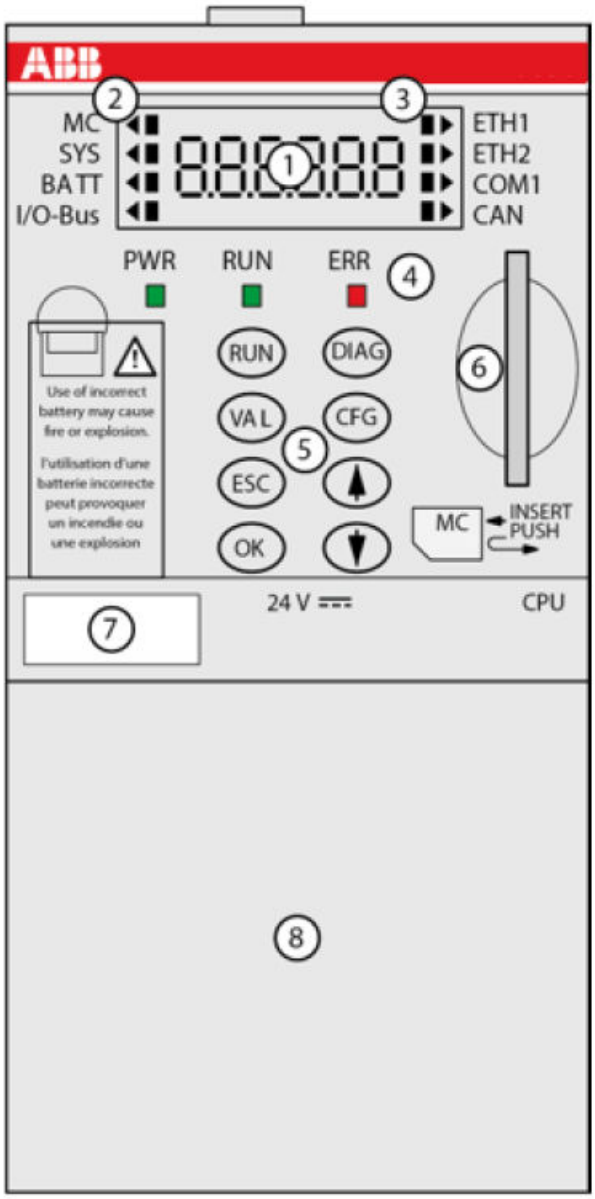
91.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

91.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 68: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680	PM5685
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1)]	6 slots [1)]	-	6 slots

Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1)] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

92 PM572

- PM572



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

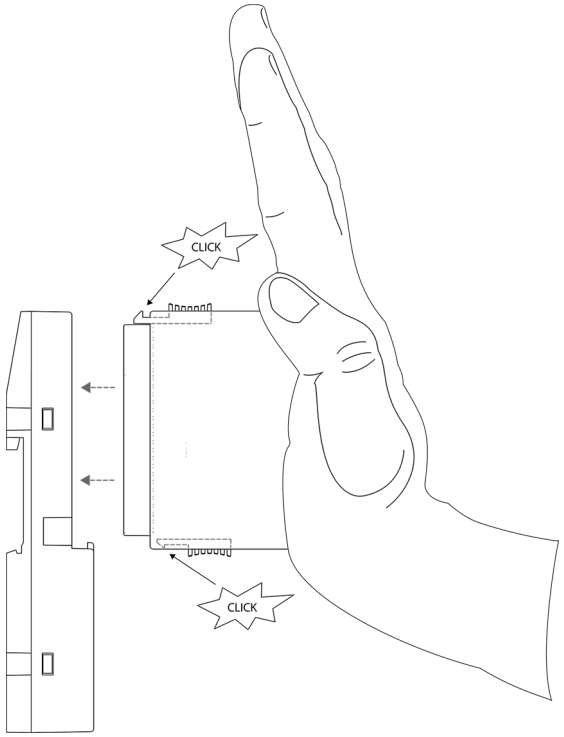
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

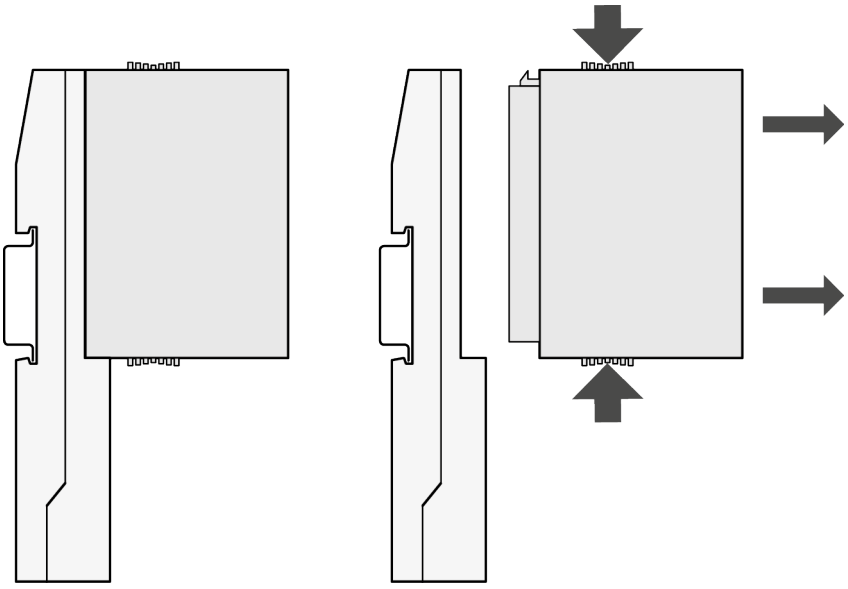
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

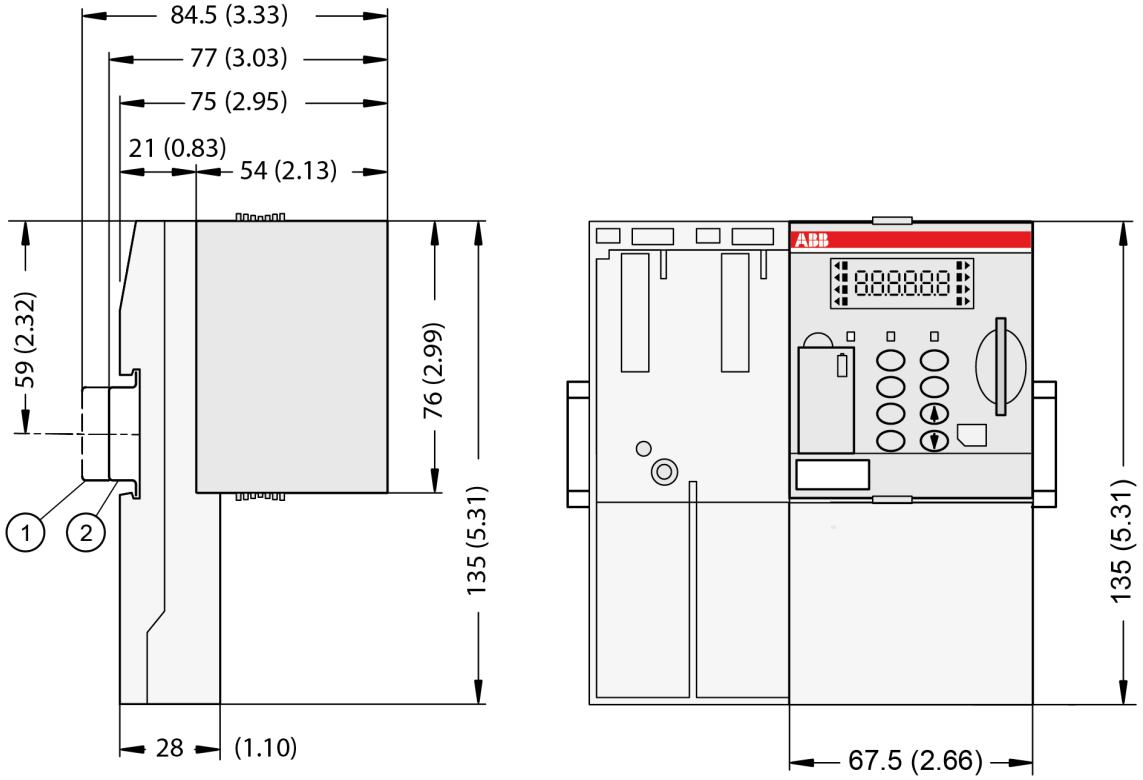
92.1 Assembly



92.2 Disassembly



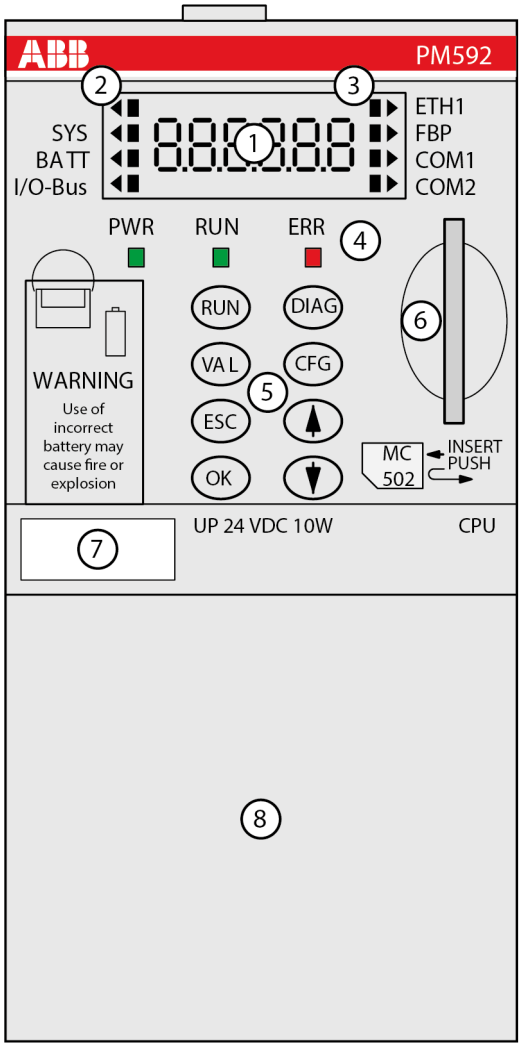
92.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

92.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

93 PM573-ETH(-XC)

- PM573-ETH
- PM573-ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

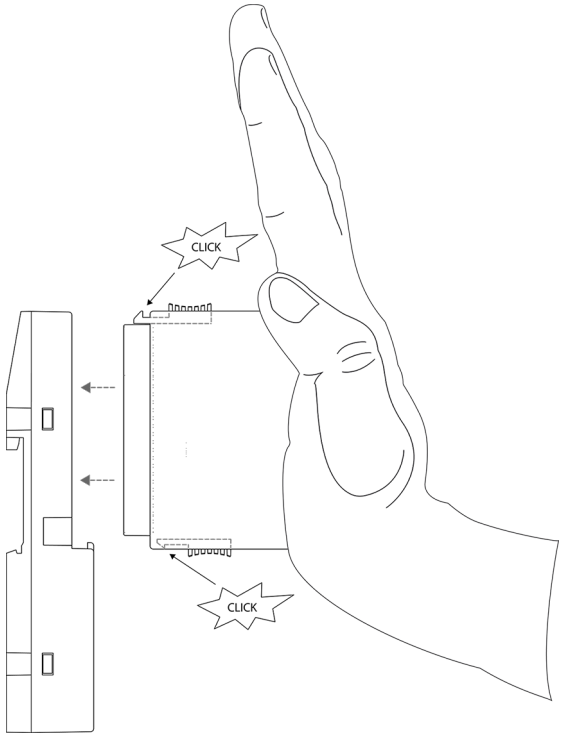
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

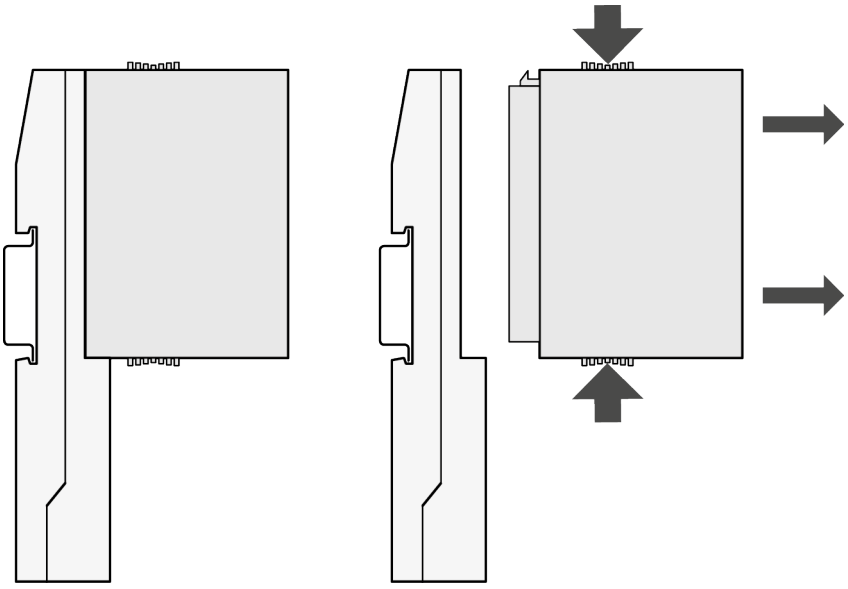
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

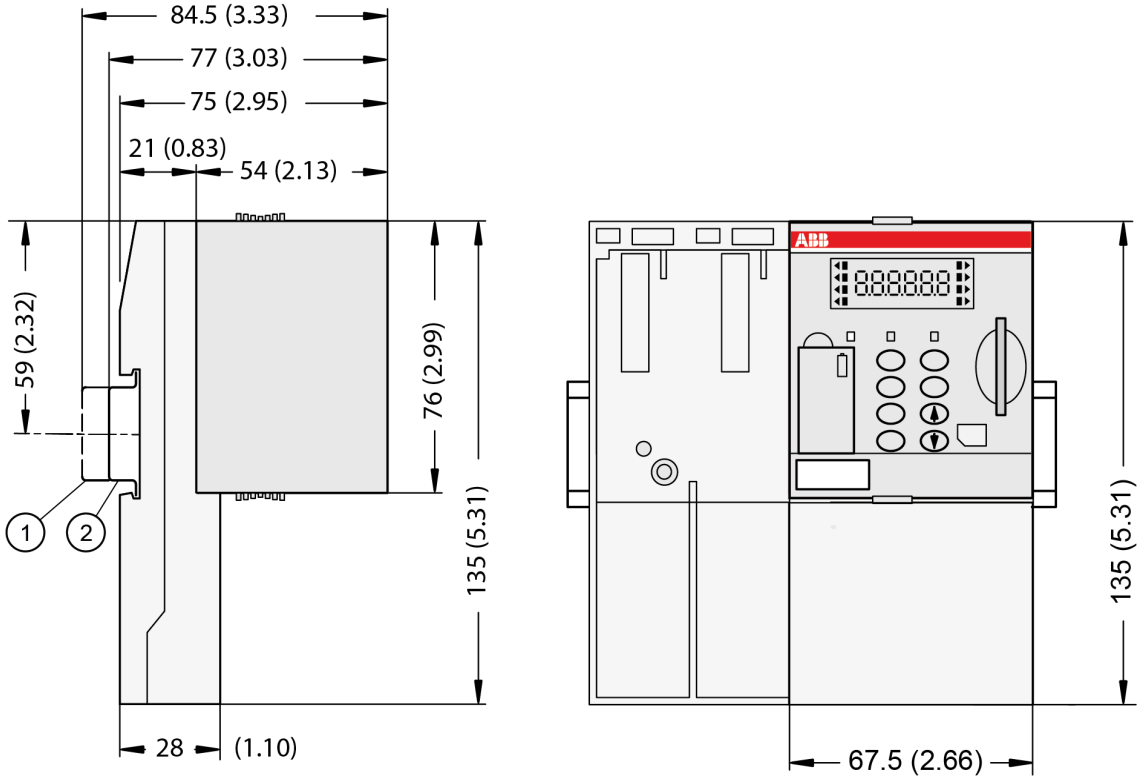
93.1 Assembly



93.2 Disassembly



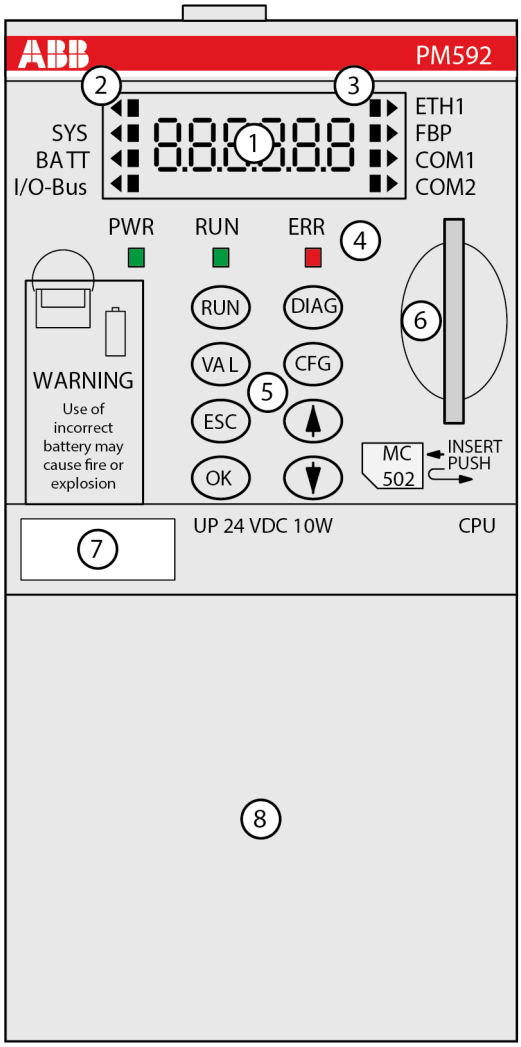
93.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

93.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

94 PM582(-XC)

- PM582
- PM582-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

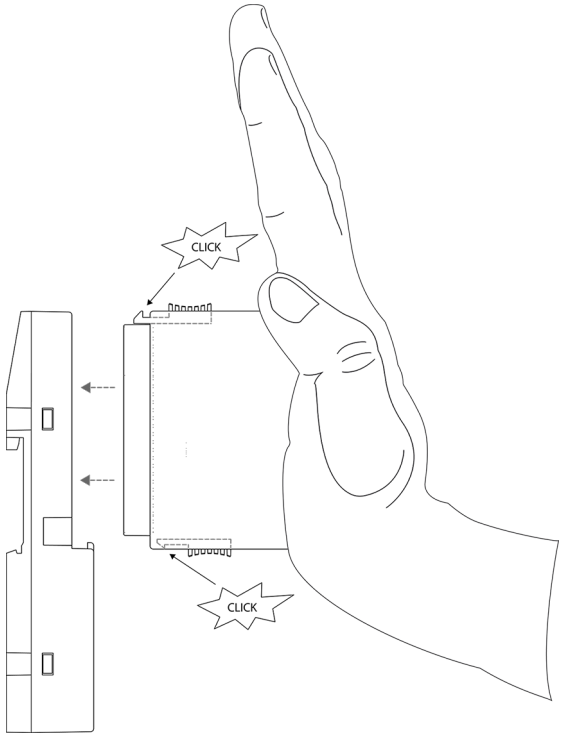
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

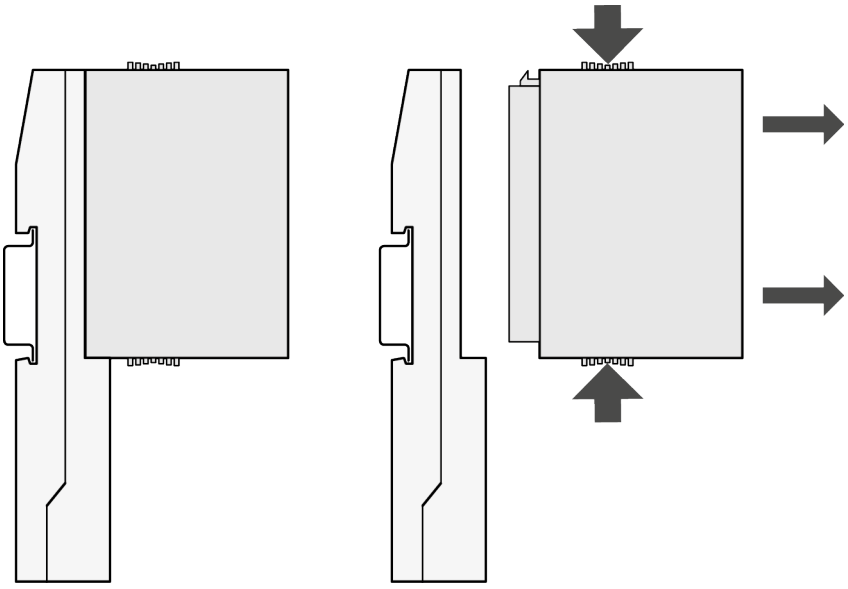
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

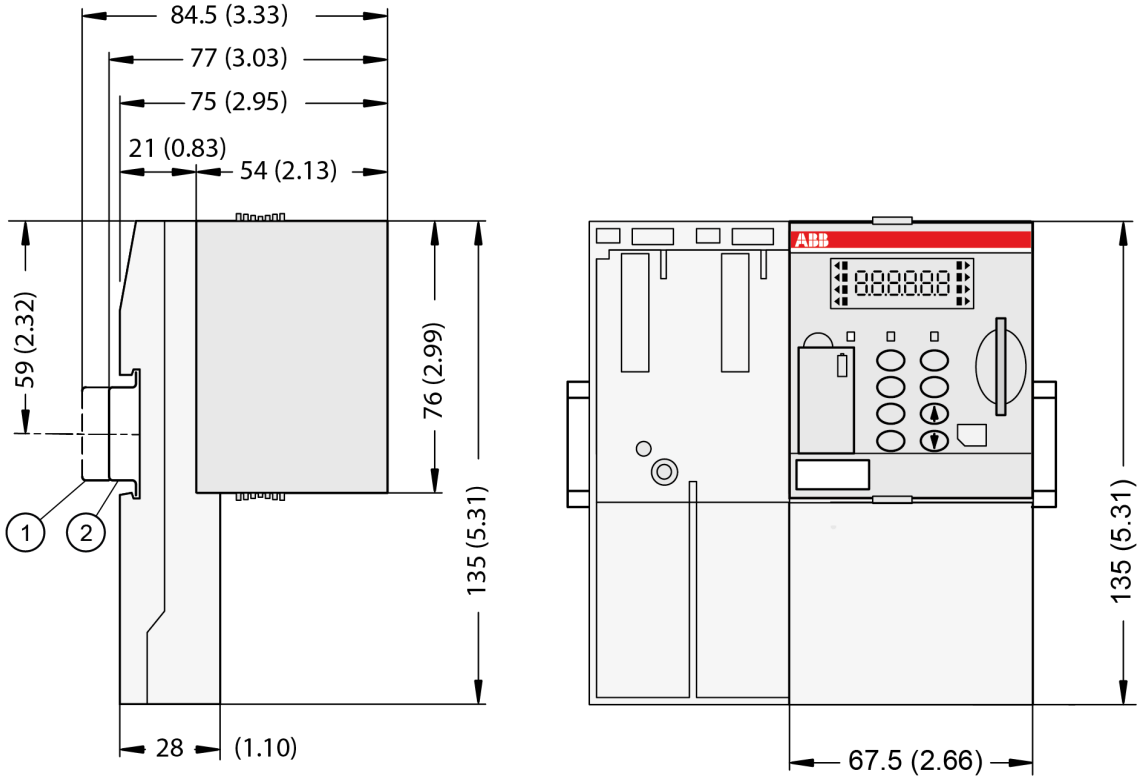
94.1 Assembly



94.2 Disassembly



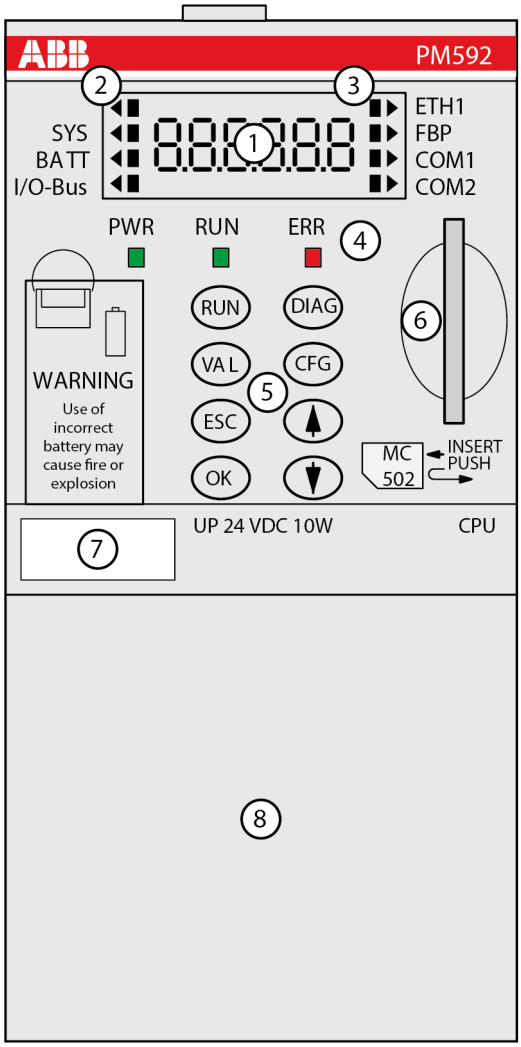
94.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

94.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

95 PM583-ETH(-XC)

- PM583-ETH
- PM583-ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

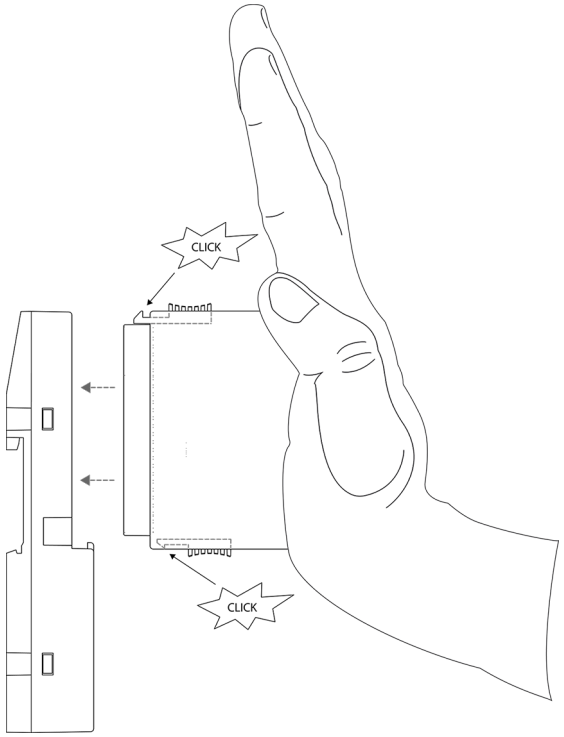
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

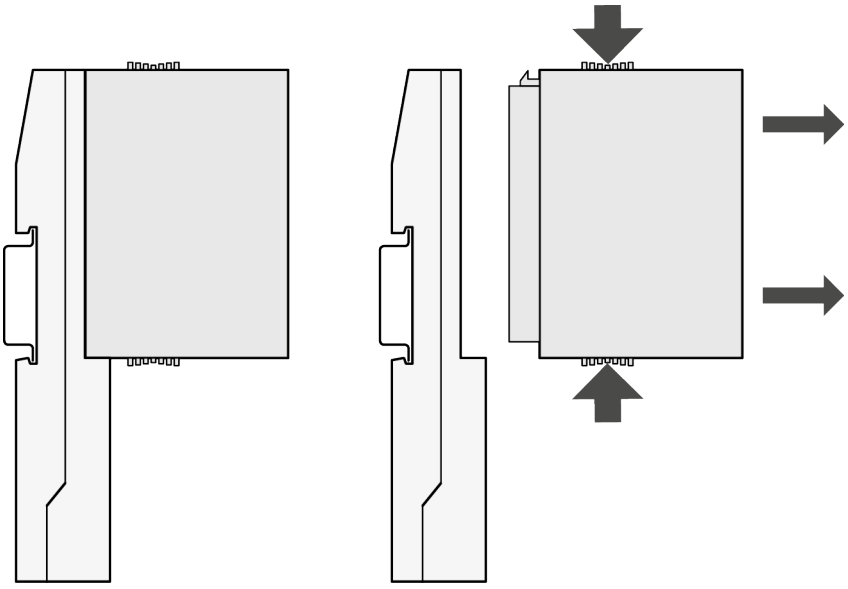
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

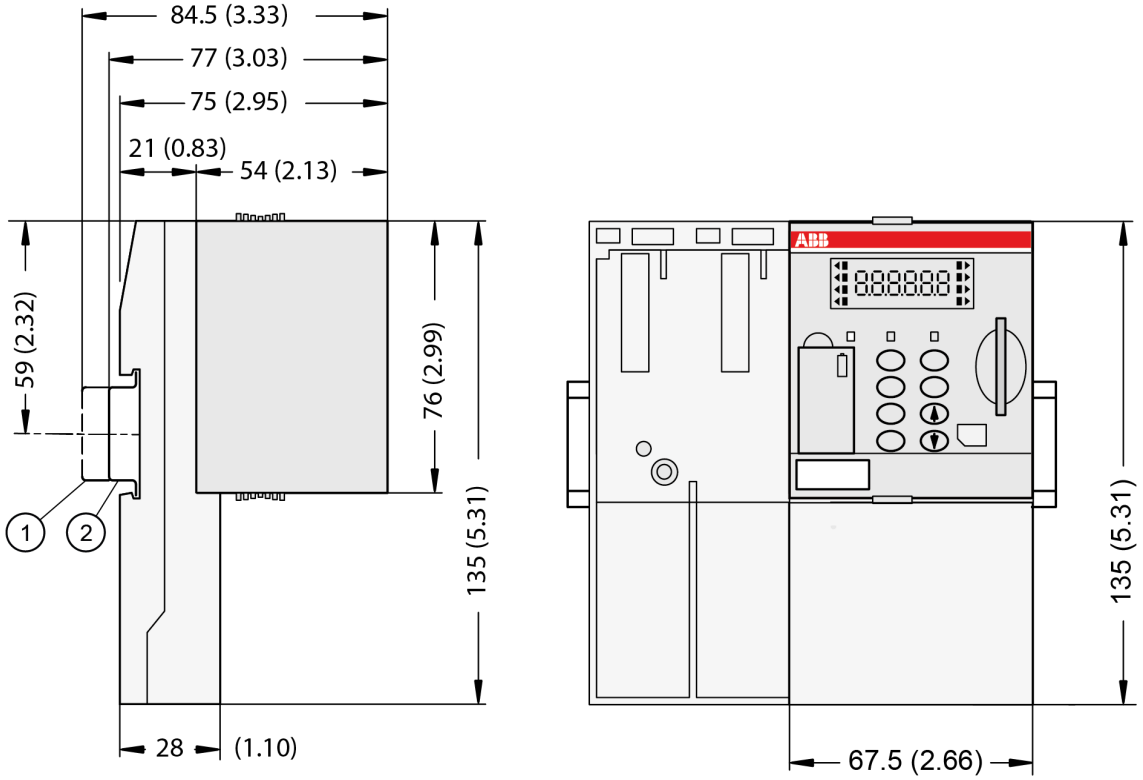
95.1 Assembly



95.2 Disassembly



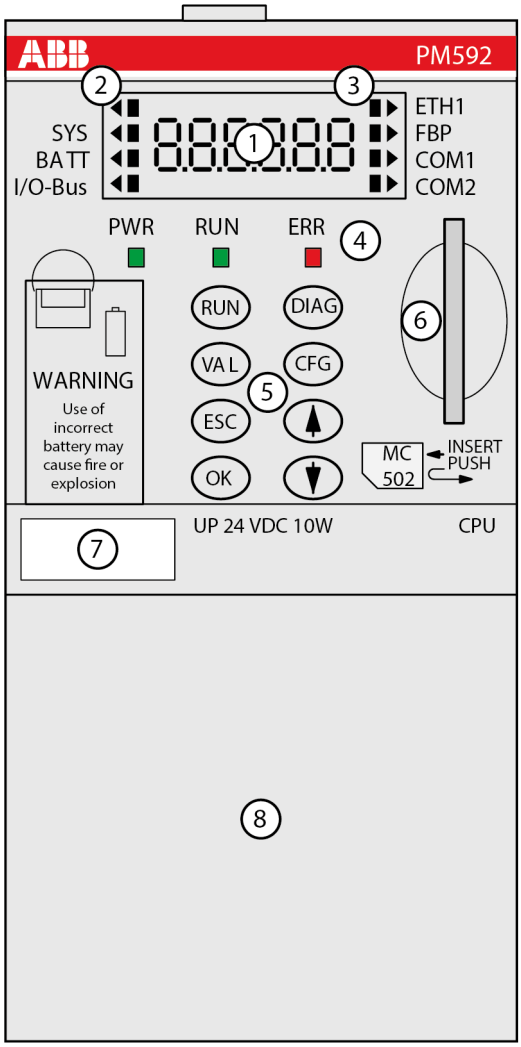
95.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

95.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

96 PM585-ETH

- PM585-ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

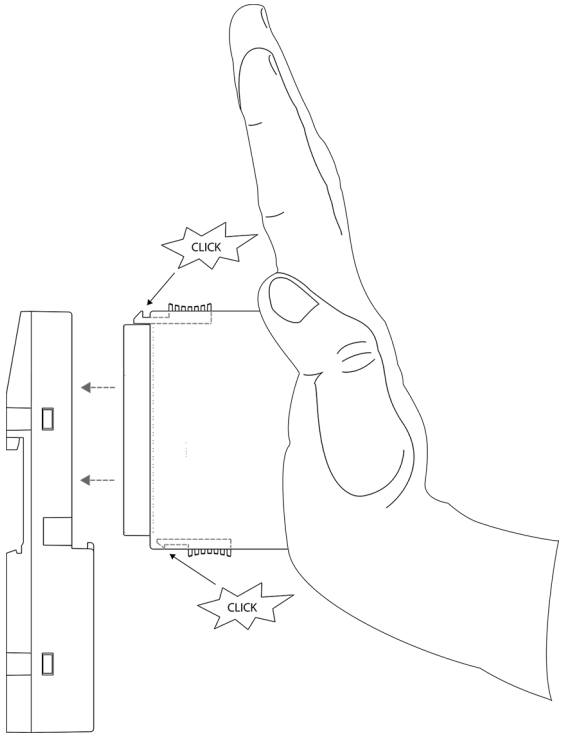
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

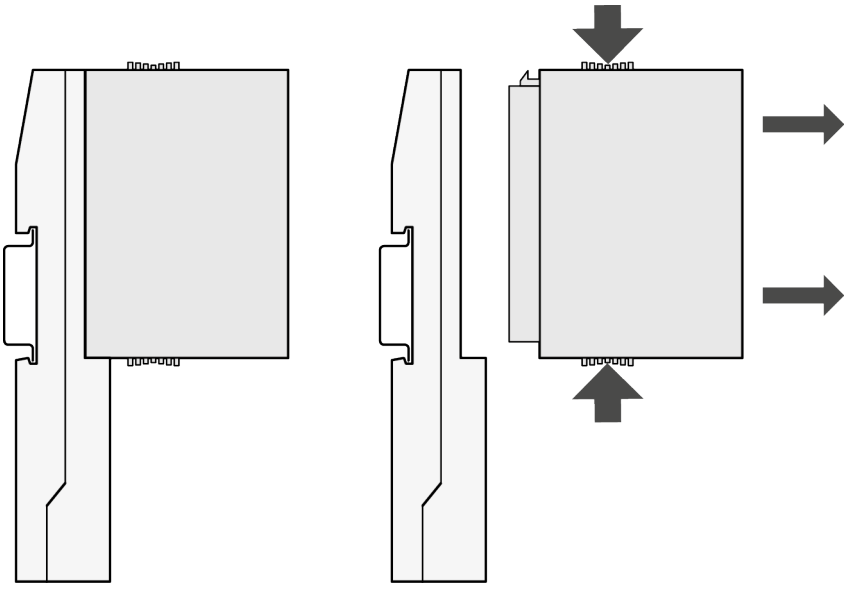
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

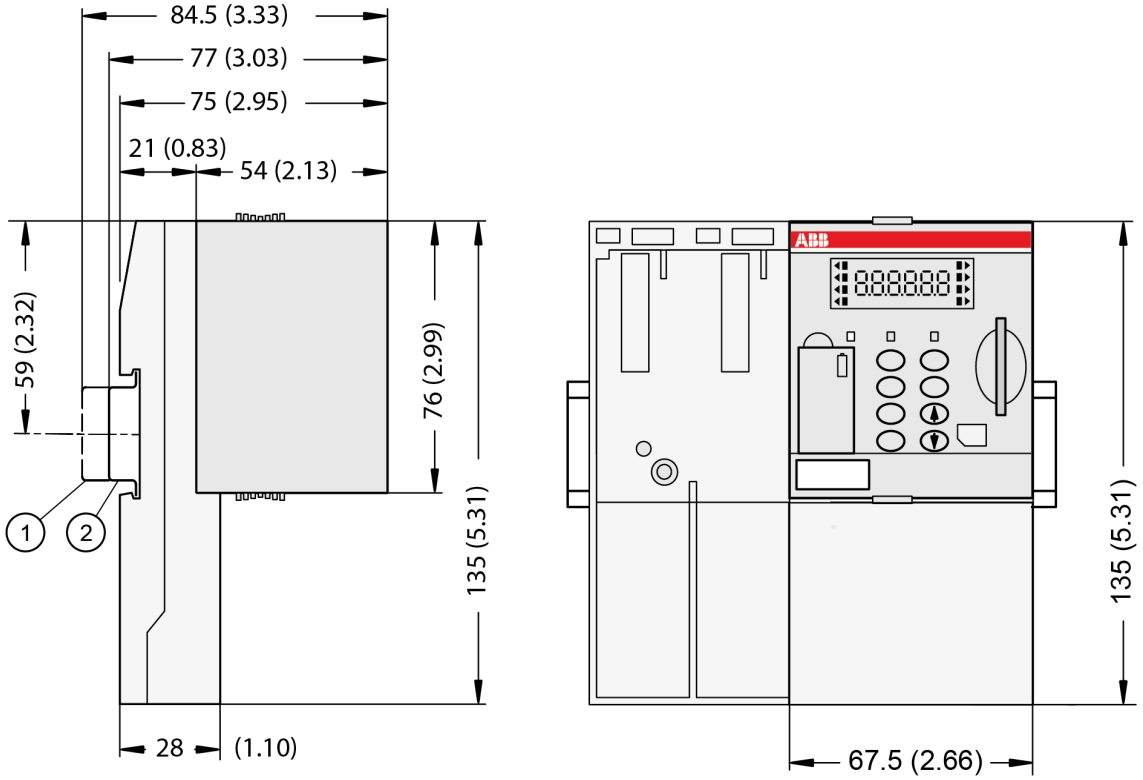
96.1 Assembly



96.2 Disassembly



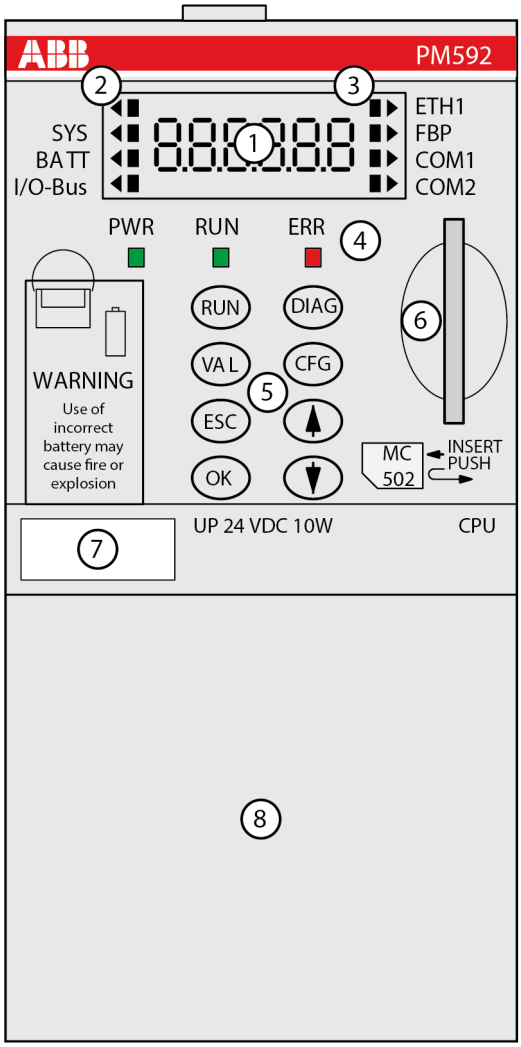
96.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

96.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

97 PM590-x

- PM590-ARCNET
- PM590-ETH



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

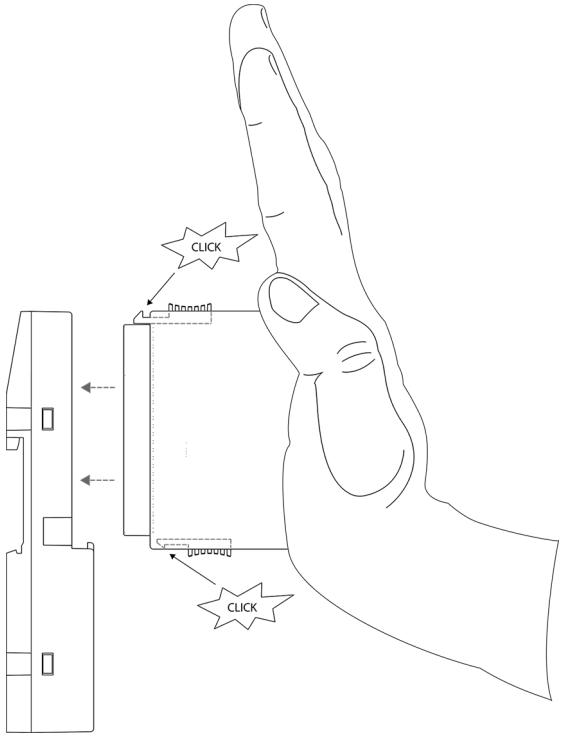
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

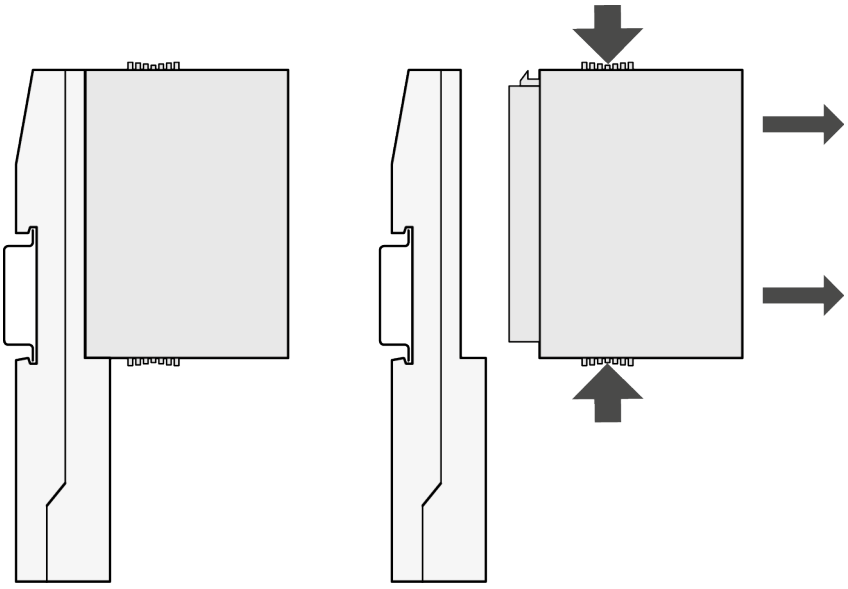
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

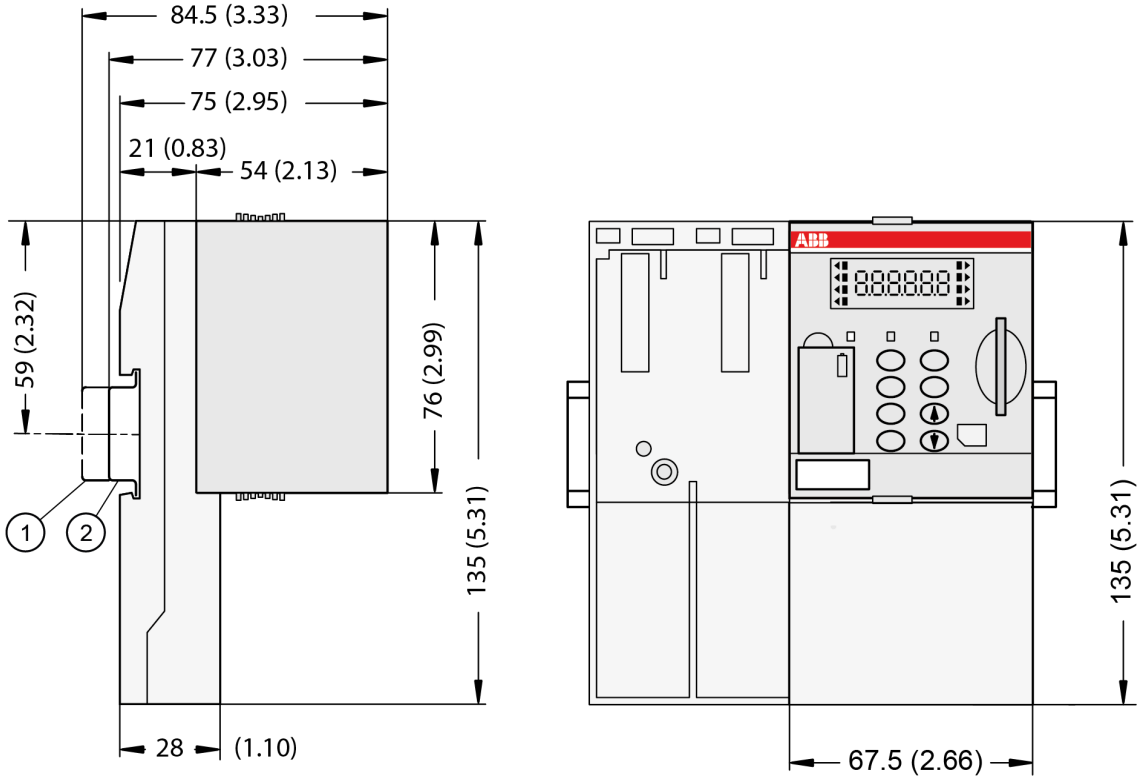
97.1 Assembly



97.2 Disassembly



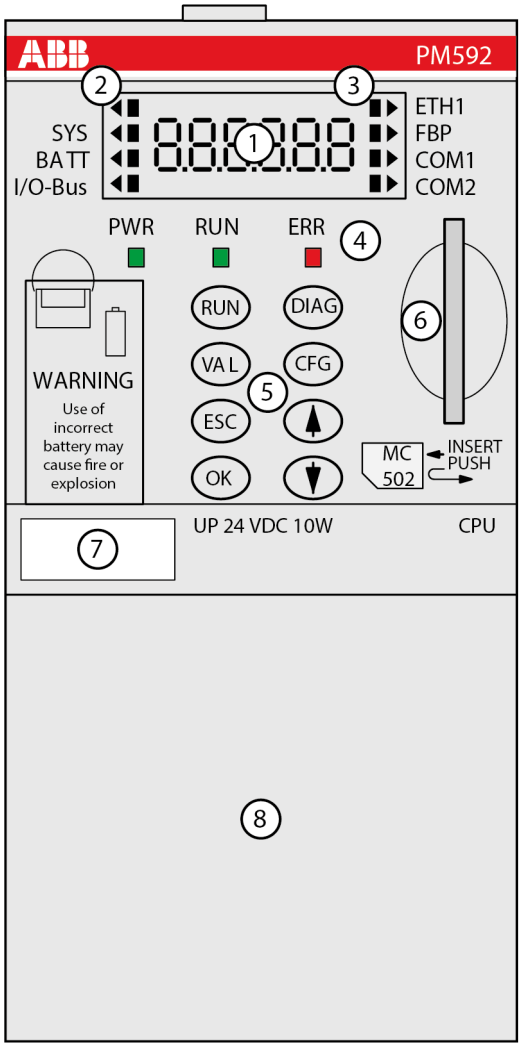
97.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

97.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.

❄ Sign for XC version

98 PM591-ETH(-XC)

- PM591-ETH
- PM591-ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

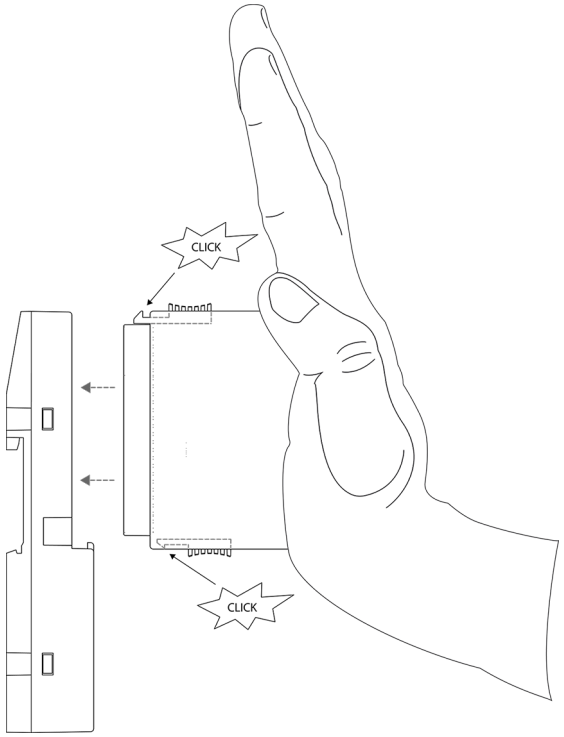
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

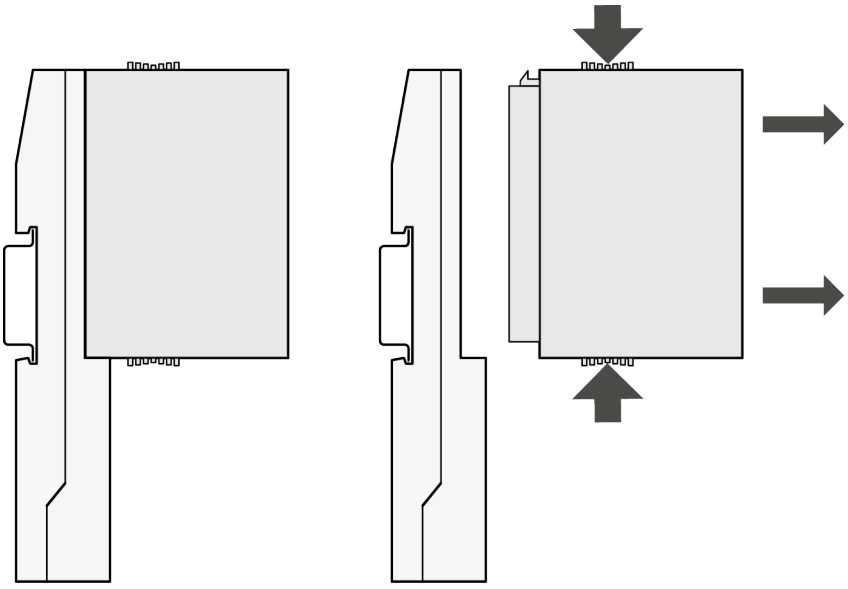
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

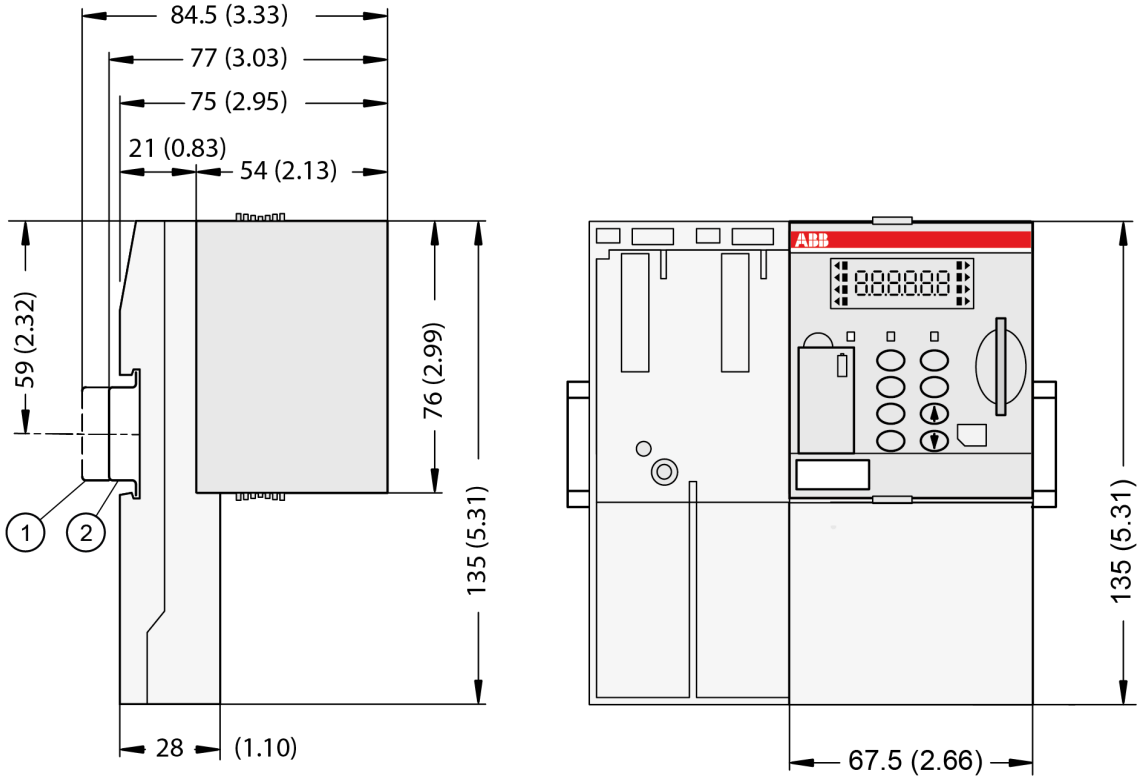
98.1 Assembly



98.2 Disassembly



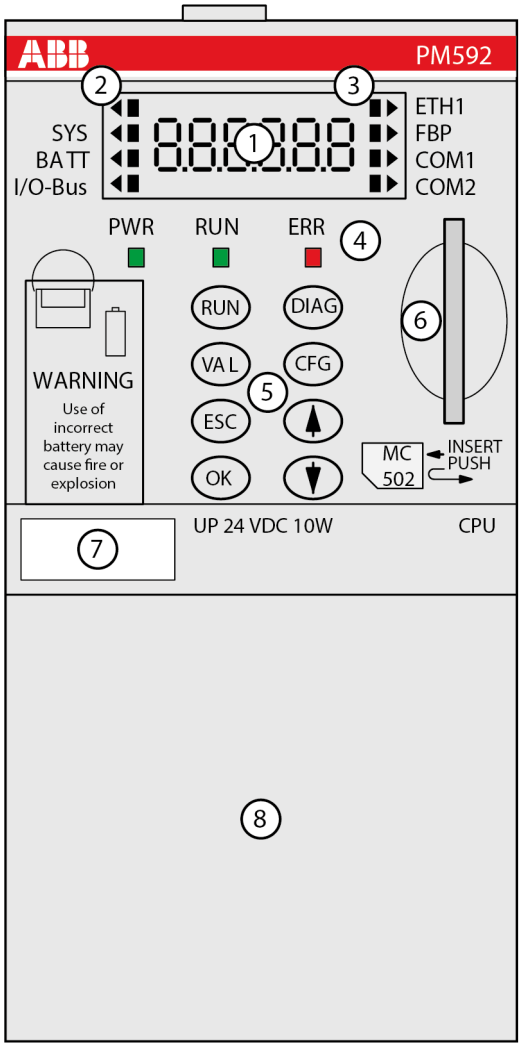
98.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

98.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

99 PM592-ETH(-XC)

- PM592-ETH
- PM592-ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

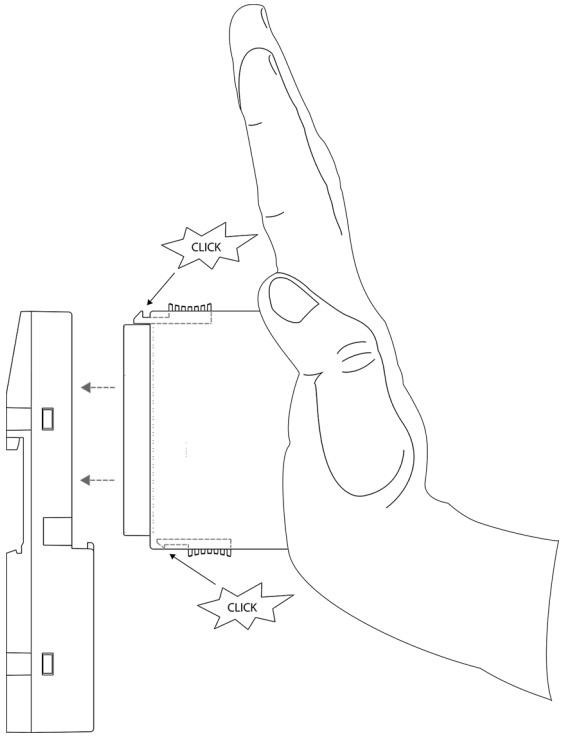
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM57x-ETH, PM58x-ETH and PM59x-ETH with ordering No. 1SAPxxxxxxR0271 can only be used with terminal bases TB5xx with ordering No. 1SAPxxxxxxR0270.

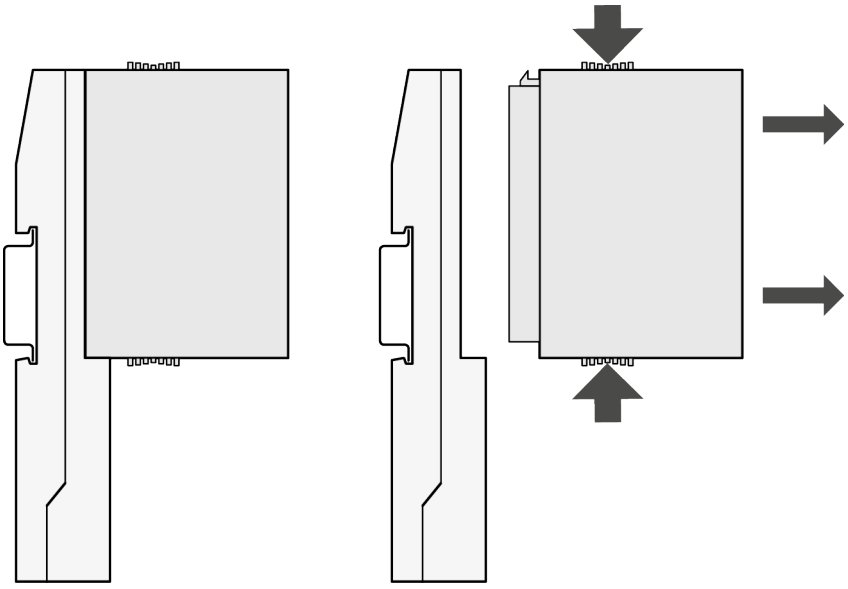
Processor module PM591-2ETH can only be used with TB523-2ETH.

The processor modules PM59x-ETH can only be used with terminal bases TB5xx with product index C6 or higher. Otherwise, they should be updated to that index.

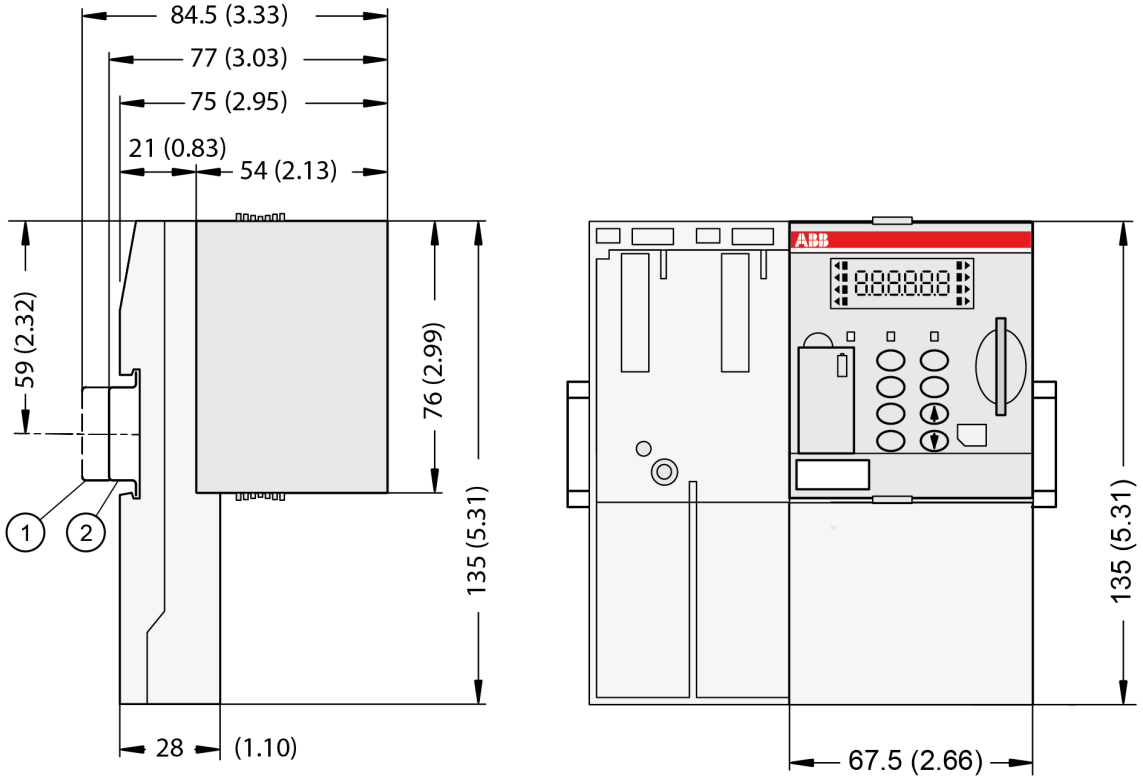
99.1 Assembly



99.2 Disassembly



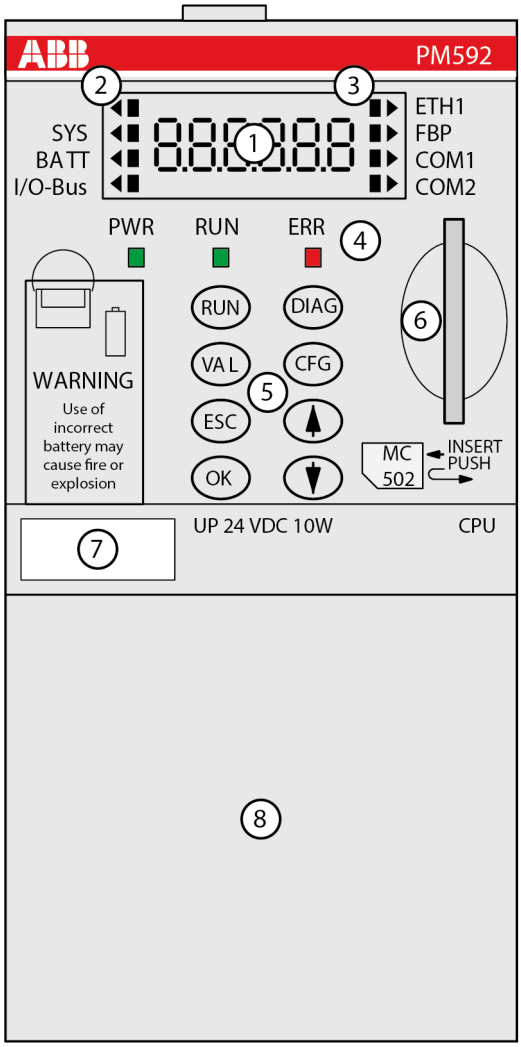
99.3 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

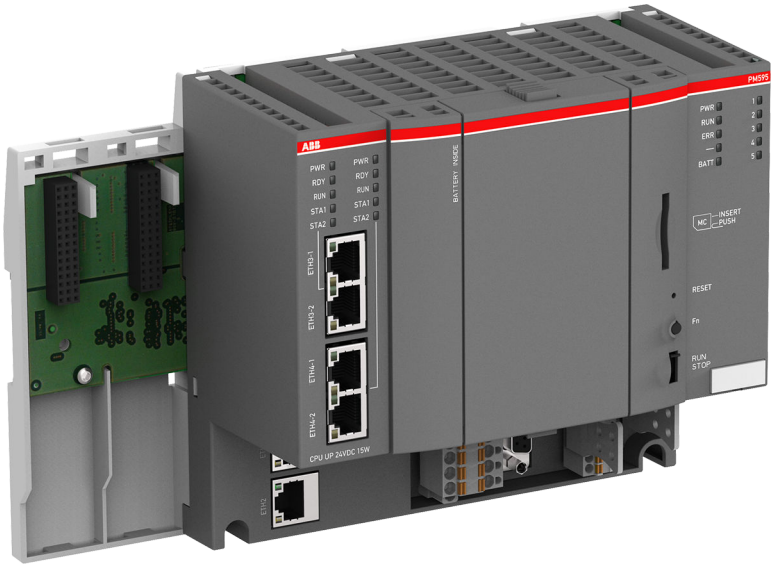
99.4 Connections



1 Status displays (7-segment)
2 Triangle displays for ”Item”
3 Square displays for ”Status”
4 Status LEDs
5 Function keys
6 Slot for memory card
7 TA525: Label
8 The connection part may be different on various terminal base types. See installation instructions of the specific terminal base suitable for this CPU for connection specifications.
❄ Sign for XC version

100 PM595-4ETH-x(-XC)

- PM595-4ETH-F
- PM595-4ETH-M-XC



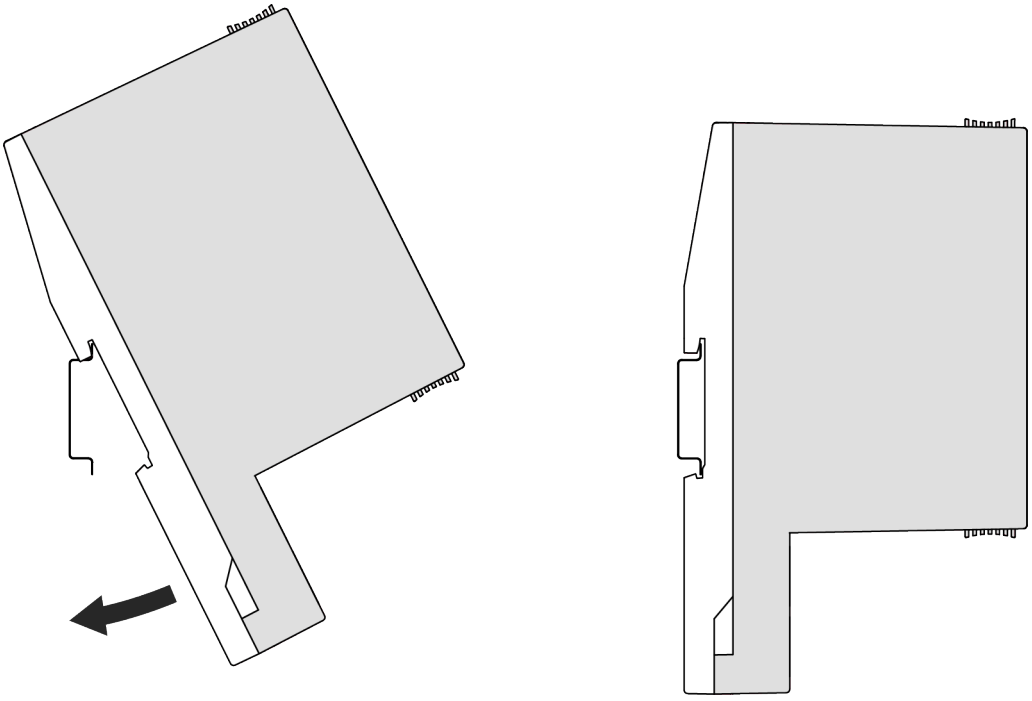
CAUTION!

Risk of injury and damaging the product!

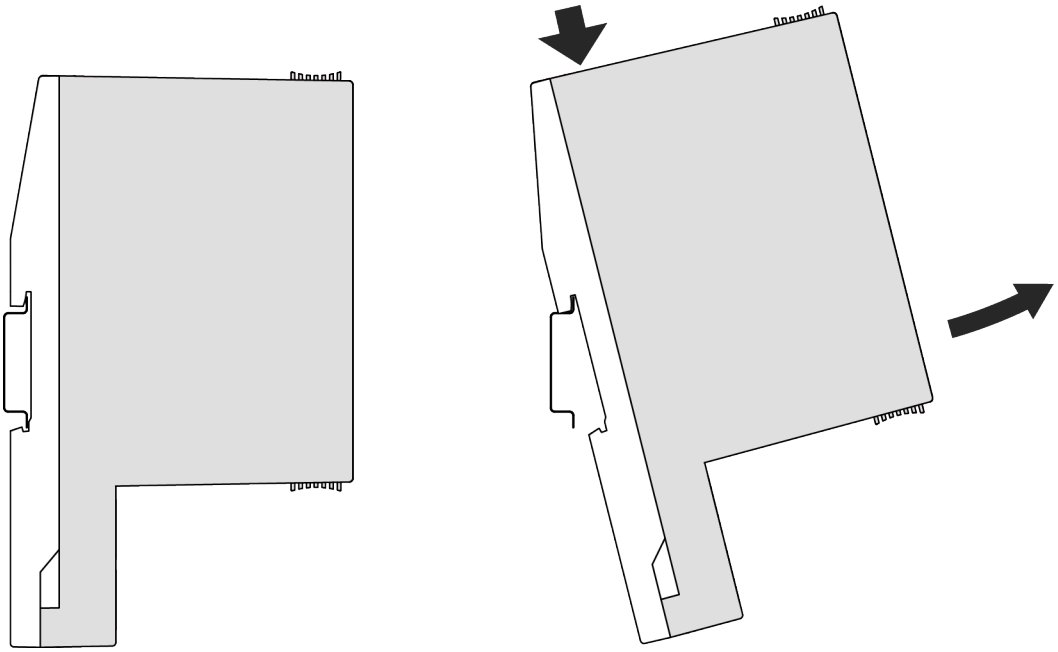
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

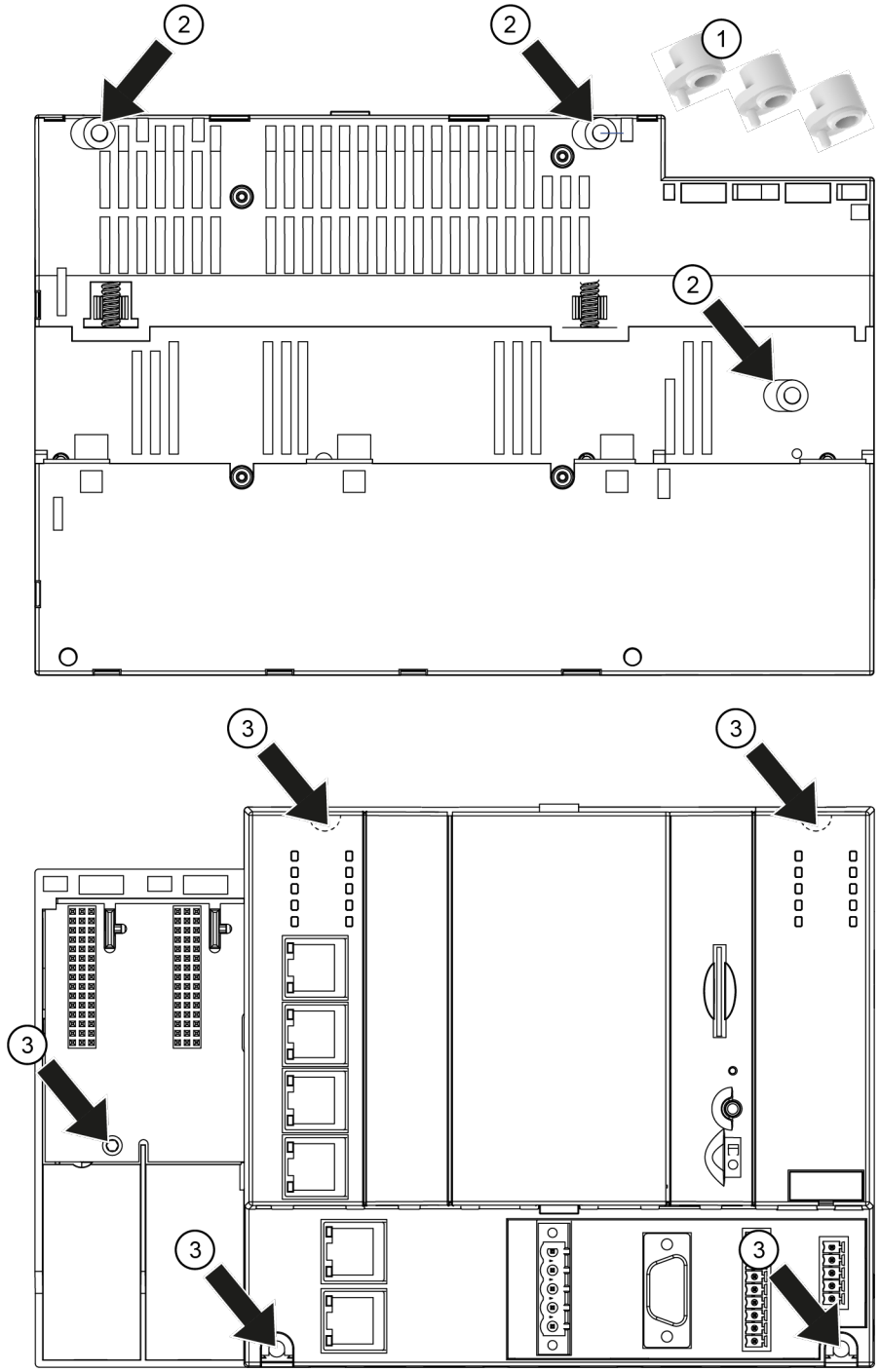
100.1 Assembly



100.2 Disassembly



100.3 Assembly with screws



1 3 parts of TA543 screw mounting accessory
2 3 slots for TA543 screw mounting accessory
3 5 holes for screw mounting

1. Insert 3 parts of the TA543 screw mounting accessory into the slots on the back side of the processor module.

⇨

NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA543 screw mounting accessory (1SAP182800R0001) is mandatory to prevent bending and damage to the module.

2. Fasten the processor module with 5 screws (M4, max 1.2 Nm) from the front side.

⇨

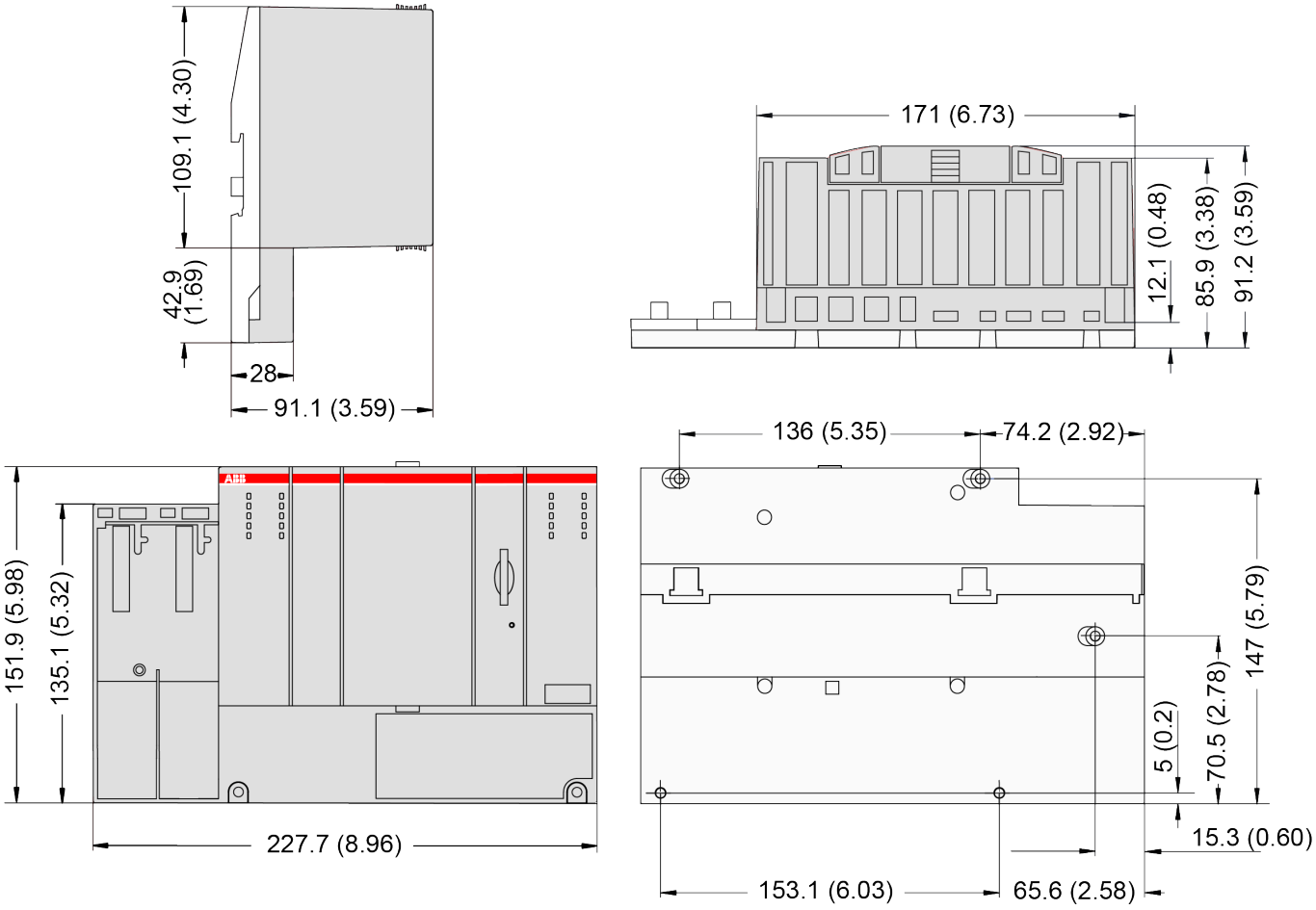
With screw mounting, the processor module is grounded through the screws.

It is necessary that

- *the screws have a conductive surface (e.g. steel zinc-plated or brass nickel-plated)*
- *the mounting plate is grounded*
- *the screws have a good electrical contact to the mounting plate*

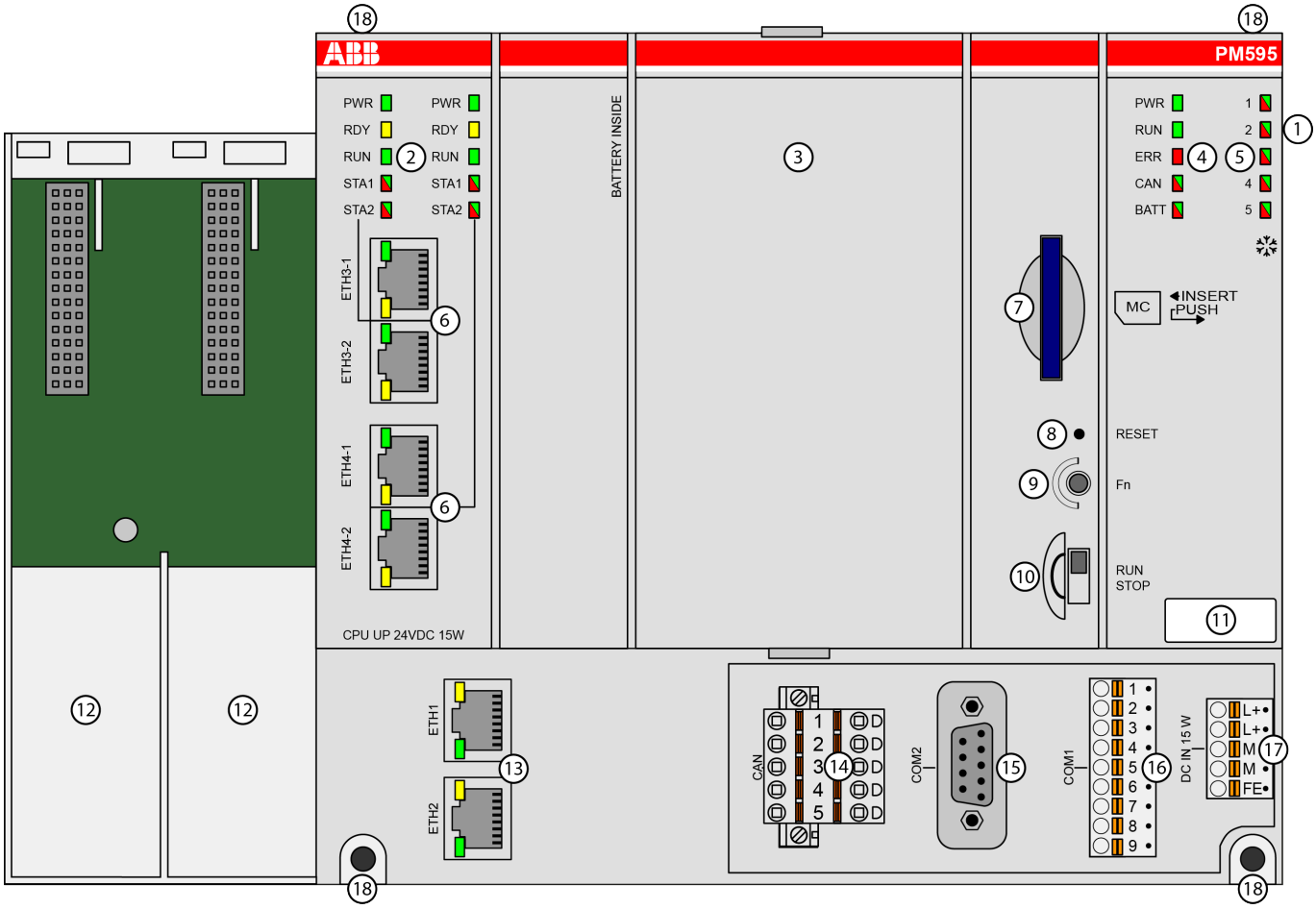
To prevent the screw from loosening after prolonged use, a thread lock washer is highly recommended.

100.4 Dimensions



The dimensions are in mm and in brackets in inch.

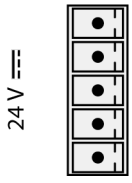
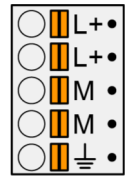
100.5 Connections



1 I/O bus for connection of I/O modules
2 2x 5 LEDs to display the states of the fieldbuses
3 Cover for battery and display
4 5 LEDs to display the states of the processor module
5 5 LEDs (reserved)
6 2x2 RJ45 interfaces for fieldbuses
7 Slot for memory card
8 Reset button
9 Button (reserved)
10 RUN/STOP switch
11 Label
12 Slots for communication modules (max 2; unused slots must be covered with TA524)
13 2 RJ45 interfaces for Ethernet connection
14 5-pin terminal block (reserved)
15 Serial interface COM2 (D-sub 9)
16 Serial interface COM1 (9-pin terminal block, removable)
17 Power supply (5-pin terminal block, removable)
18 5 holes for screw mounting
❄ Sign for XC version

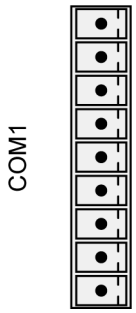
100.5.1 Power supply

Pin assignment

Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

100.5.2 Serial interface COM1

Pin assignment (RS-485 / RS-232)



Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

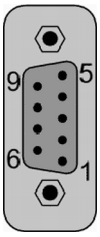
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

100.5.3 Serial interface COM2

Pin assignment



Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

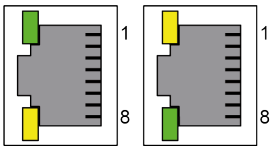
Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

100.5.4 Ethernet network interface

Pin assignment

	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

101 SM560-S(-FD-x)(-XC)

- SM560-S
- SM560-S-XC
- SM560-S-FD-1
- SM560-S-FD-1-XC
- SM560-S-FD-4
- SM560-S-FD-4-XC



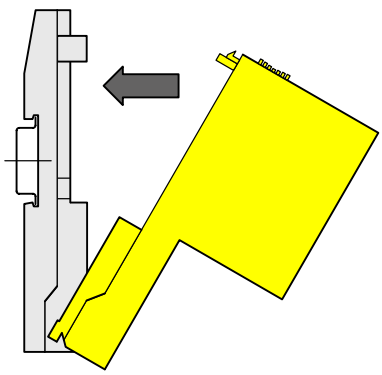
CAUTION!

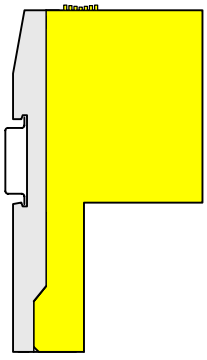
Risk of injury and damaging the product!

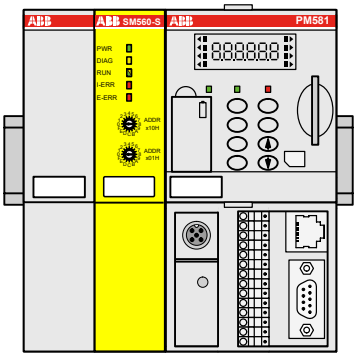
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

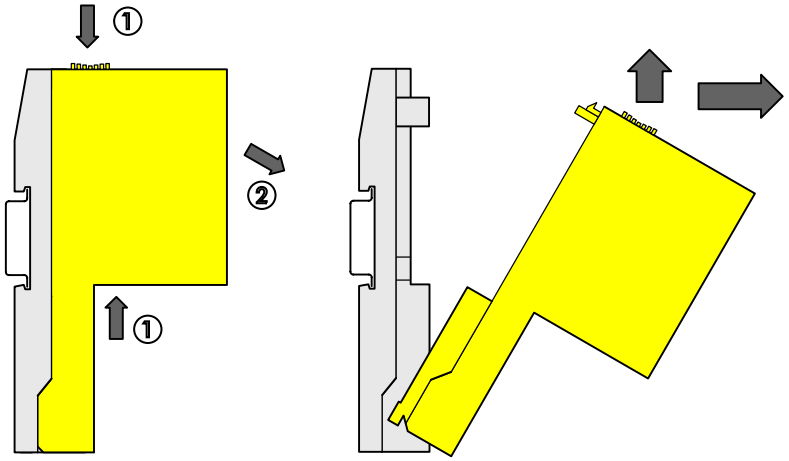
101.1 Assembly



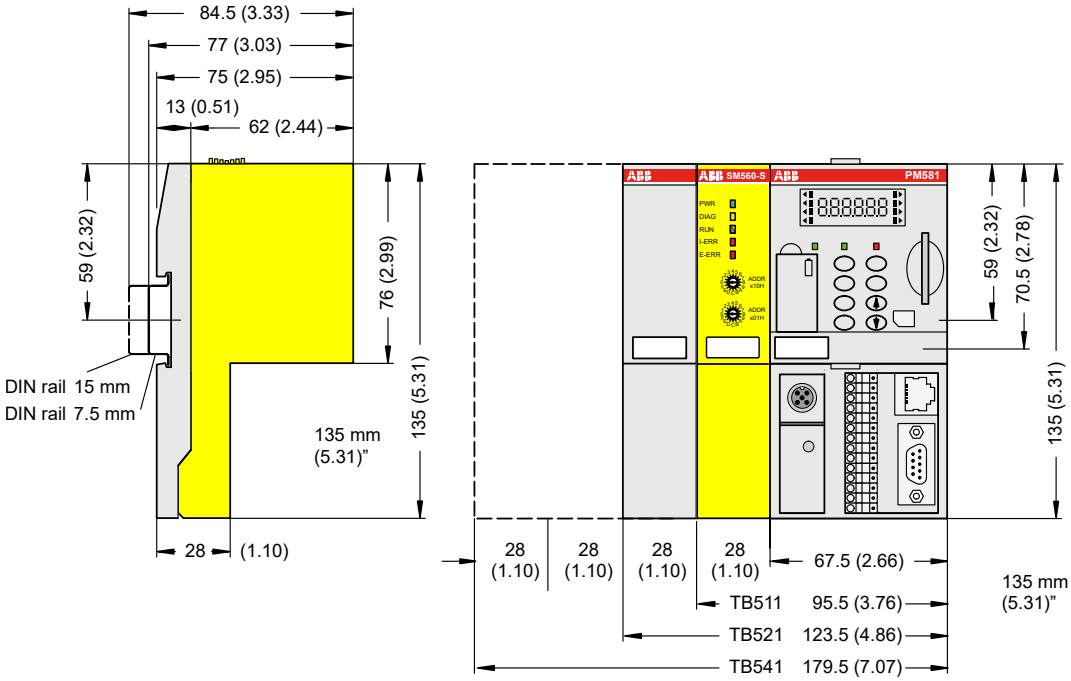




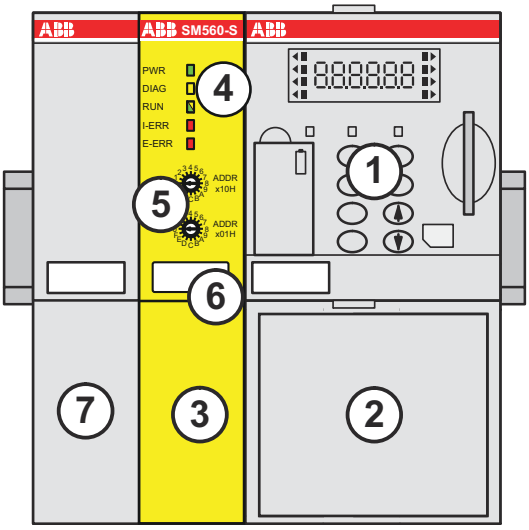
101.2 Disassembly



101.3 Dimensions



101.4 Connections



1 CPU
2 Connectors of the CPU
3 Safety CPU
4 System LEDs
5 2 rotary switches for address/configuration
6 TA525 Label
7 TA524 Dummy communication module
❄ Sign for XC version

102 TA5101-4DI(W) - Option board for digital I/O extension

- TA5101-4DI
- TA5101-4DIW



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

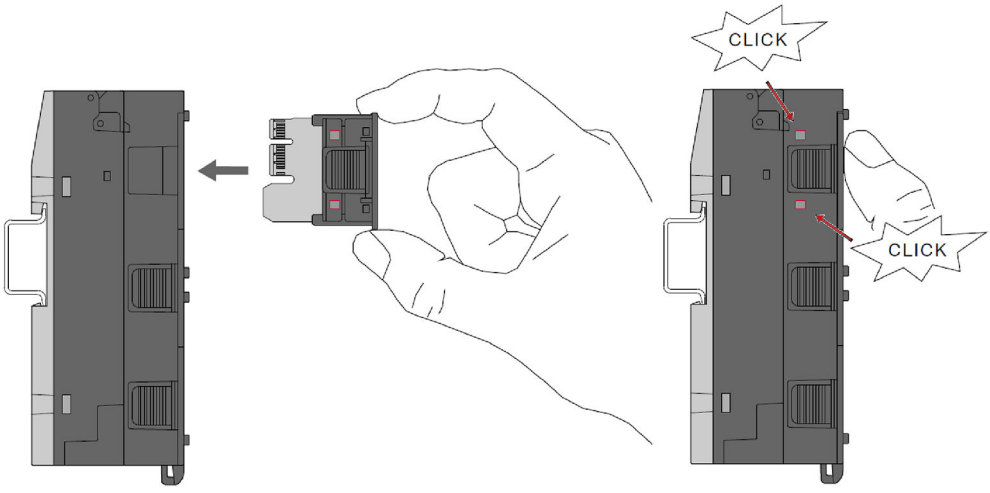
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

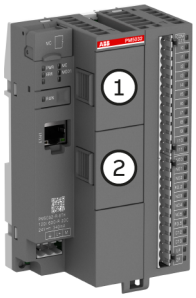
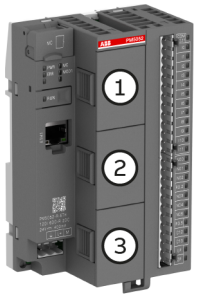
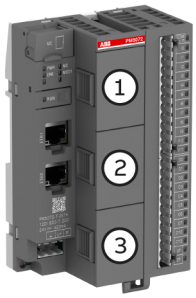
102.1 Assembly



102.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 69: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

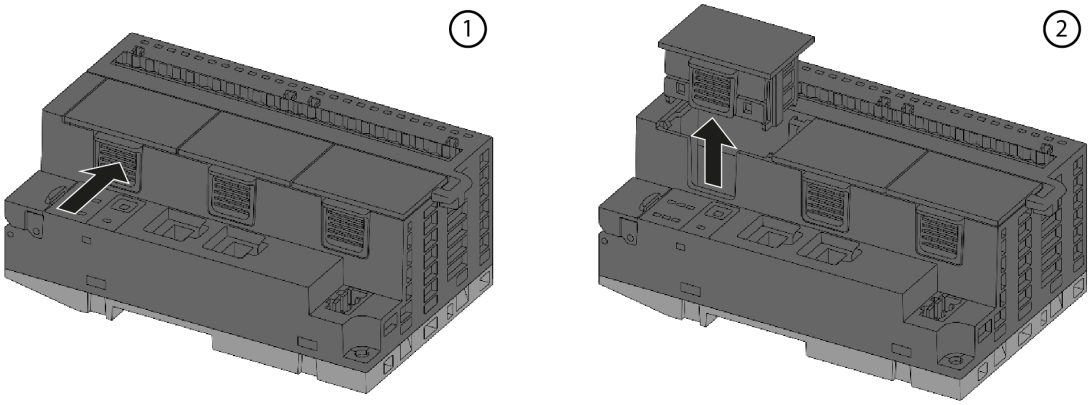
The optimized mounting position can be easily determined with the help of this table.

Table 70: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

102.2 Disassembly



CAUTION!

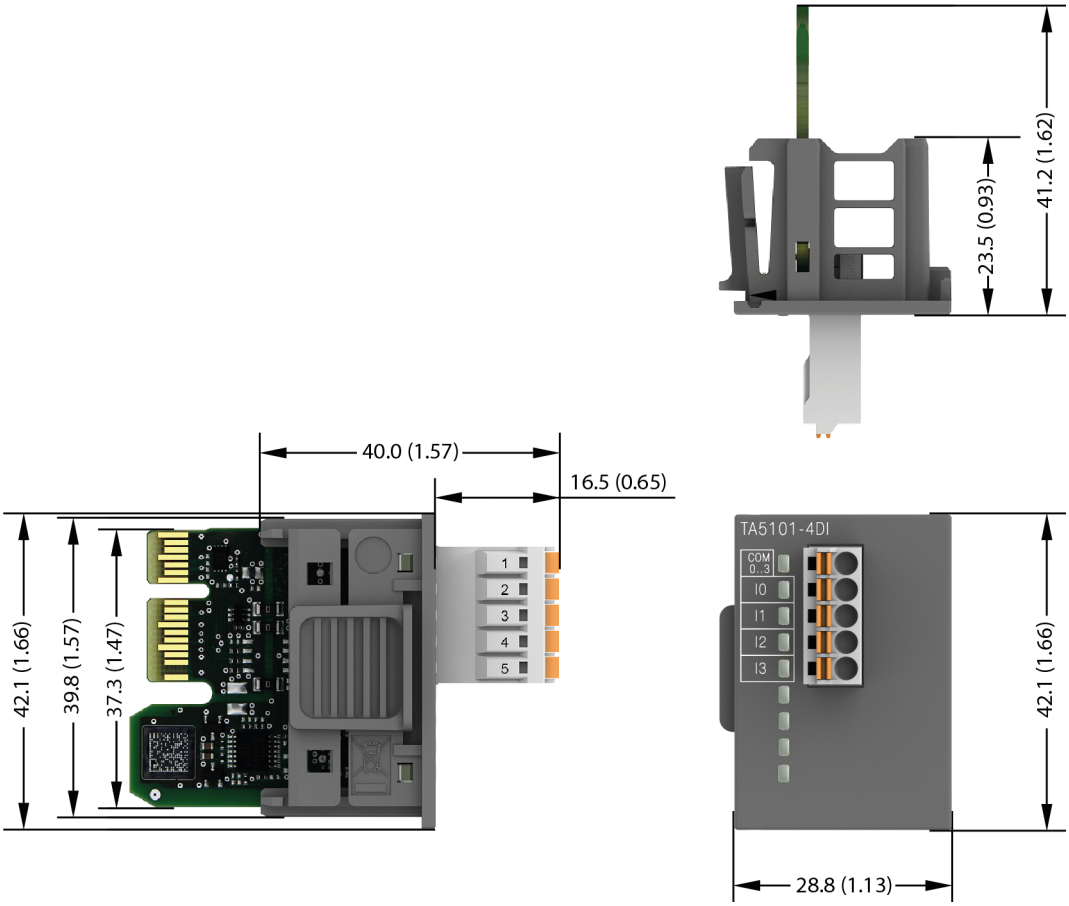
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

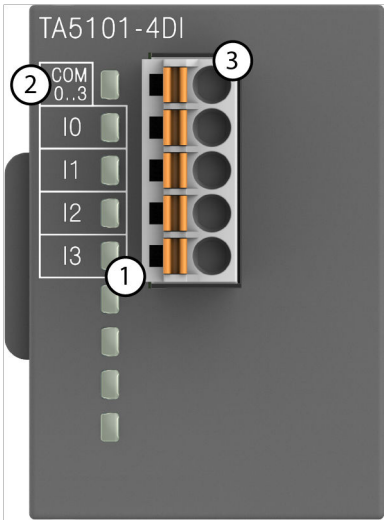
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

102.3 Dimensions



The dimensions are in mm and in brackets in inch.

102.4 Connections



1 4 yellow LEDs to display the signal states at the digital inputs I0 to I3
2 Allocation of signal name
3 5-pin terminal block for input signals

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

The digital inputs can be used as source inputs or as sink inputs.

NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

NOTICE!

Risk of malfunctions in the plant!

Only if L+/M of the CPU is available and the outputs are already configured in the AB program, the outputs will switch on as soon as the UP/ZP is available.

This must be considered in the application planning.

NOTICE!

Risk of damaging the I/O module!

The outputs are not protected against short circuits and overload.

– Never short-circuit or overload the outputs.
– Never connect the outputs to other voltages.
– Use an external 3 A fast-protection fuse for the outputs.

102.4.1 Inputs/Outputs

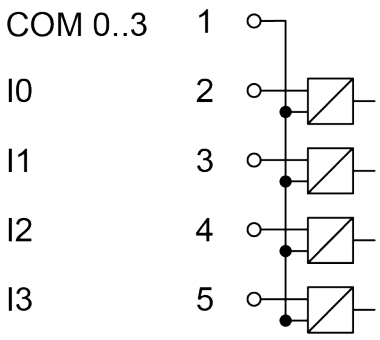
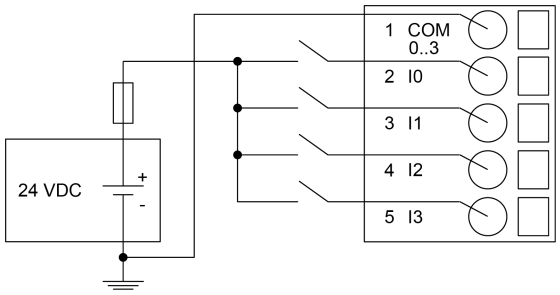
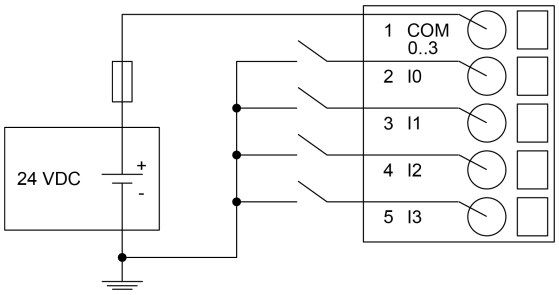


Table 71: Assignment of the terminals:

Terminal	Signal	Description
1	COM 0..3	Input common for signals I0 to I3
2	I0	Input signal I0
3	I1	Input signal I1
4	I2	Input signal I2
5	I3	Input signal I3

Table 72: Connection of the option board for digital I/O extension TA5101-4DI

Sink inputs of TA5101-4DI	Source inputs of TA5101-4DI
	

102.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

103 TA5105-4DOT(W) - Digital output module option board

- TA5105-4DOT
- TA5105-4DOTW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

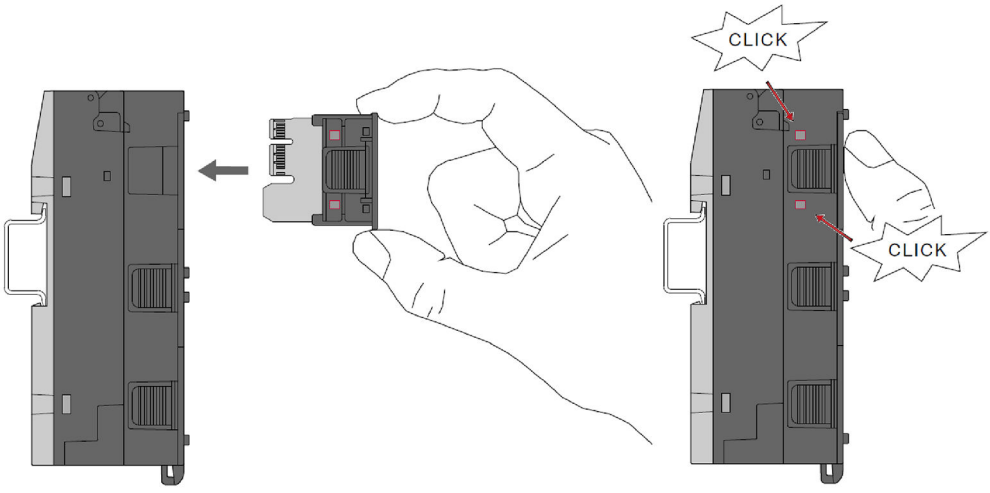
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Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

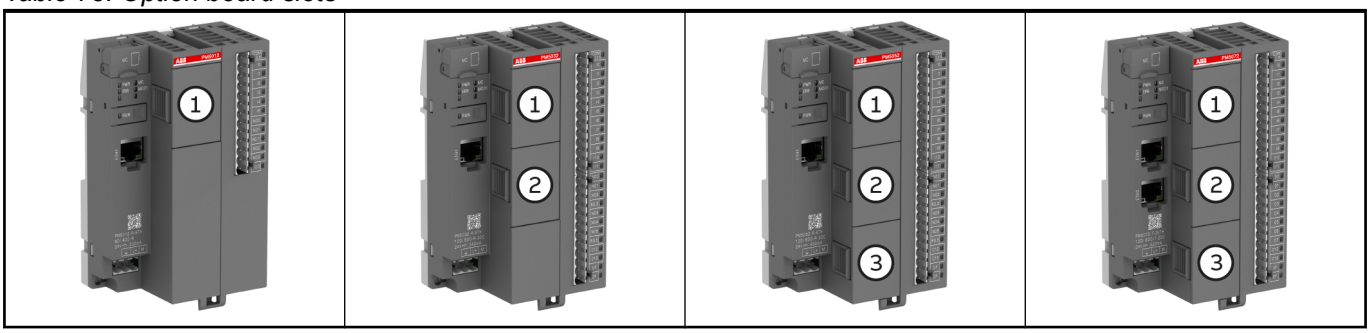
103.1 Assembly



103.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 73: Option board slots



The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

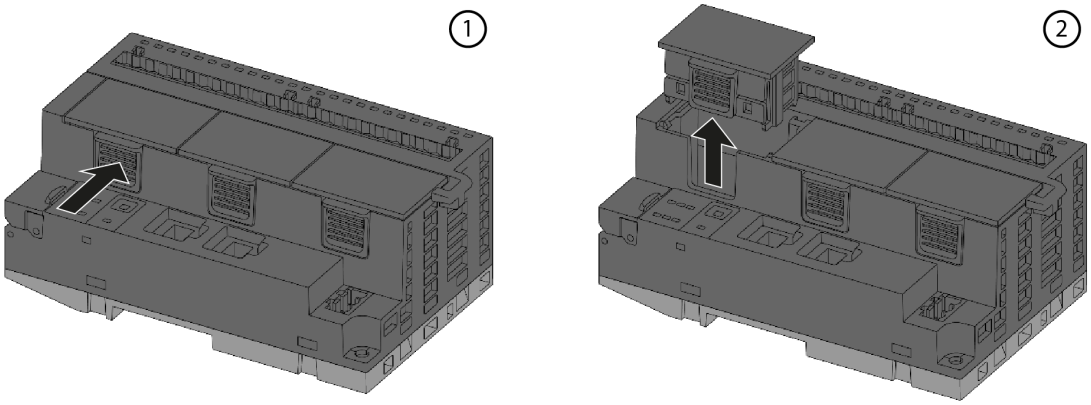
The optimized mounting position can be easily determined with the help of this table.

Table 74: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

103.2 Disassembly



CAUTION!

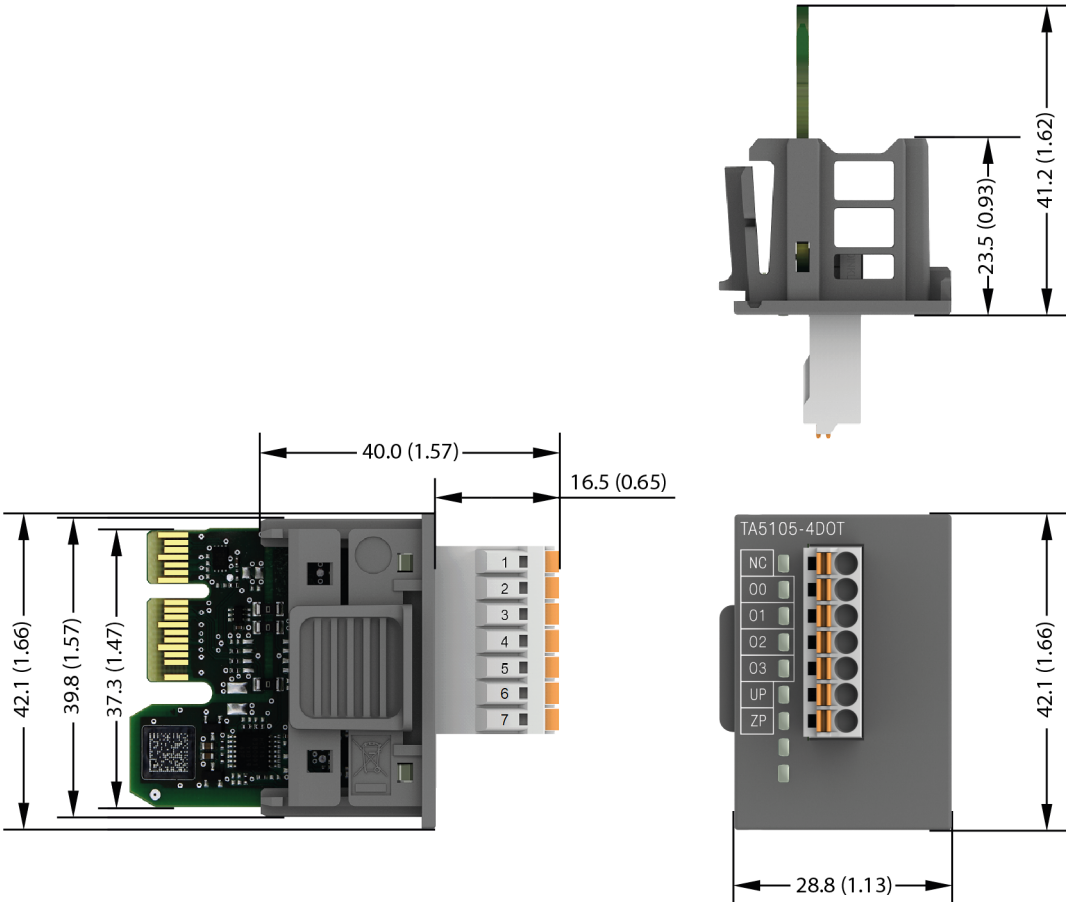
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

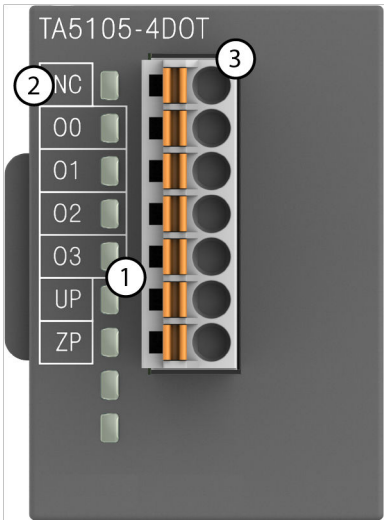
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

103.3 Dimensions



The dimensions are in mm and in brackets in inch.

103.4 Connections



1 4 yellow LEDs to display the signal states at the digital outputs O0 ... O3
2 Allocation of signal name
3 7-pin terminal block for output signals

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

The digital inputs can be used as source inputs or as sink inputs.

NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

NOTICE!

Risk of malfunctions in the plant!

Only if L+/M of the CPU is available and the outputs are already configured in the AB program, the outputs will switch on as soon as the UP/ZP is available.

This must be considered in the application planning.

NOTICE!

Risk of damaging the I/O module!

The outputs are not protected against short circuits and overload.

- Never short-circuit or overload the outputs.
- Never connect the outputs to other voltages.
- Use an external 3 A fast-protection fuse for the outputs.

103.4.1 Inputs/Outputs

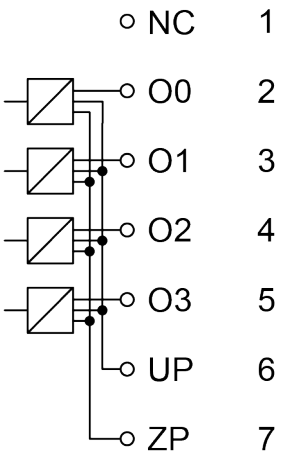


Table 75: Assignment of the terminals:

Terminal	Signal	Description
1	NC	Not connected
2	O0	Output signal O0
3	O1	Output signal O1
4	O2	Output signal O2
5	O3	Output signal O3
6	UP	Process supply voltage UP +24 V DC
7	ZP	Process supply voltage ZP 0 V DC

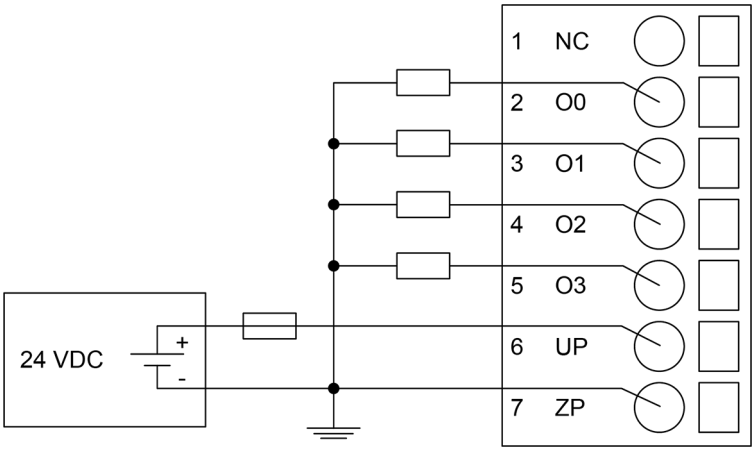


Fig. 147: Outputs of TA5105-4DOT

103.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

104 TA5110-2DI2DO(T/W) - Option board for digital I/O extension

- TA5110-2DI2DOT
- TA5110-2DI2DOW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

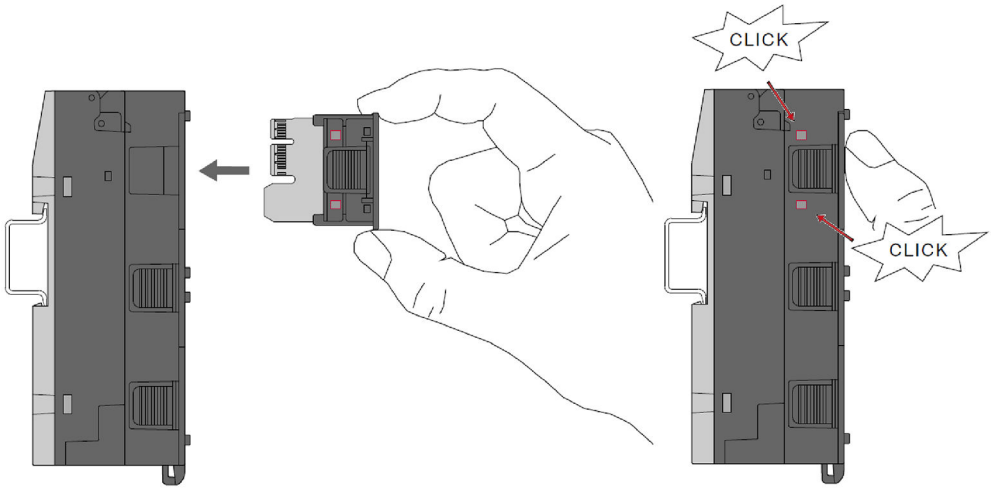
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

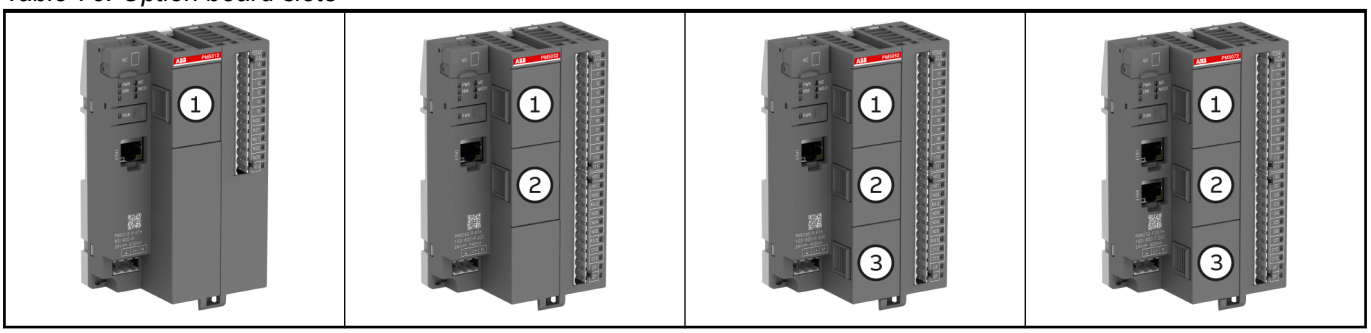
104.1 Assembly



104.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 76: Option board slots



The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

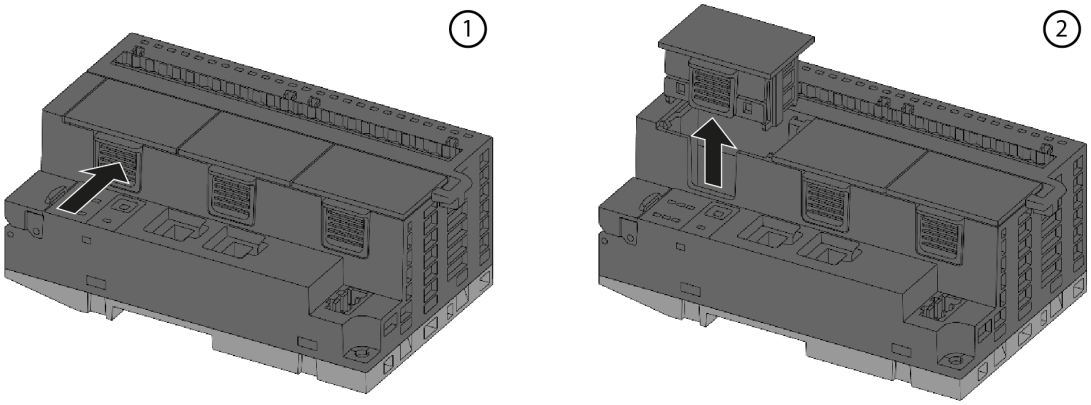
The optimized mounting position can be easily determined with the help of this table.

Table 77: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

104.2 Disassembly



CAUTION!

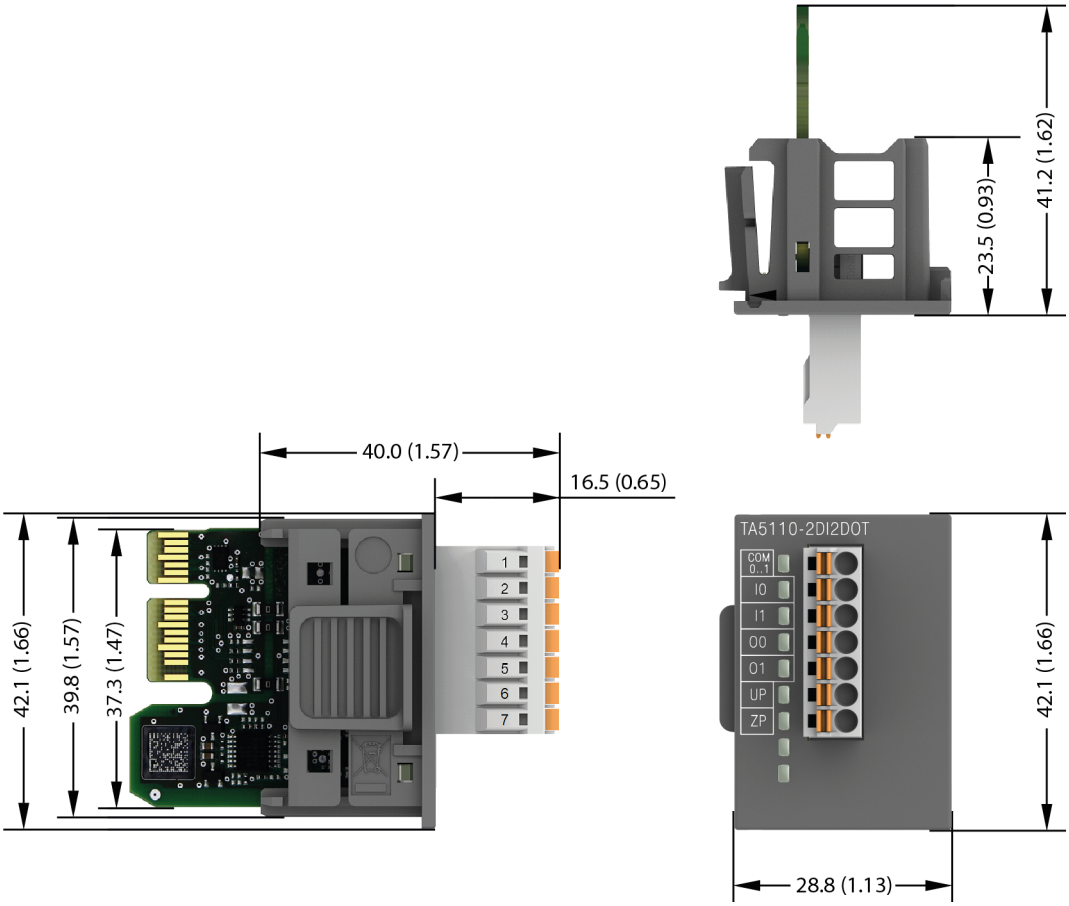
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

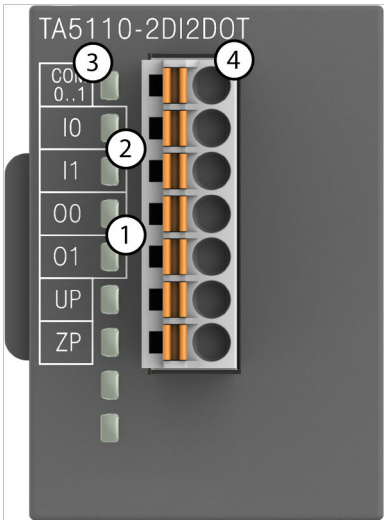
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

104.3 Dimensions



The dimensions are in mm and in brackets in inch.

104.4 Connections



1 2 yellow LEDs to display the signal states at the digital outputs O0 to O1
2 2 yellow LEDs to display the signal states at the digital inputs I0 to I1
3 Allocation of signal name
4 7-pin terminal block for input/output signals

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

The digital inputs can be used as source inputs or as sink inputs.

NOTICE!

Risk of malfunctions in the plant!

A ground fault, e. g. caused by a damaged cable insulation, can bridge switches accidentally.

Use sink inputs when possible or make sure that, in case of error, there will be no risks to persons or plant.

NOTICE!

Risk of malfunctions in the plant!

Only if L+/M of the CPU is available and the outputs are already configured in the AB program, the outputs will switch on as soon as the UP/ZP is available.

This must be considered in the application planning.

NOTICE!
Risk of damaging the I/O module!
The outputs are not protected against short circuits and overload.
– Never short-circuit or overload the outputs.
– Never connect the outputs to other voltages.
– Use an external 3 A fast-protection fuse for the outputs.

104.4.1 Inputs/Outputs

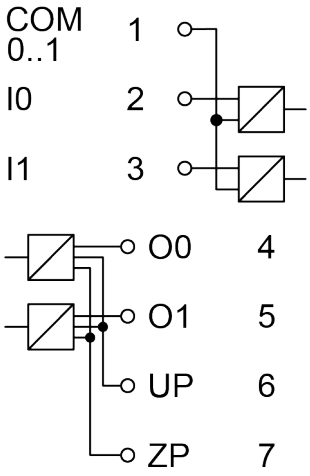
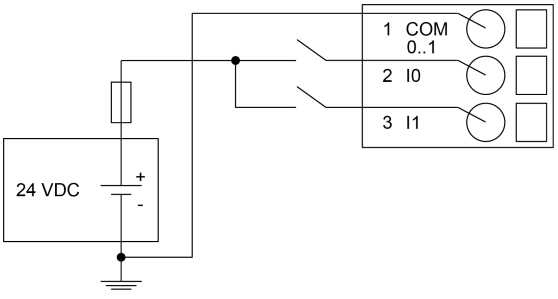
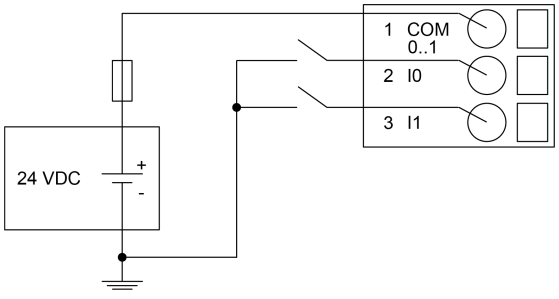


Table 78: Assignment of the terminals:

Terminal	Signal	Description
1	COM 0 ... 1	Input common for signals I0 to I1
2	I0	Input signal I0
3	I1	Input signal I1
4	O0	Output signal O0
5	O1	Output signal O1
6	UP	Process supply voltage UP +24 V DC
7	ZP	Process supply voltage ZP 0 V DC

Table 79: Connection for inputs of the option board for digital I/O extension TA5110-2DI2DOT

Sink inputs of TA5110-2DI2DOT	Source inputs of TA5110-2DI2DOT
	

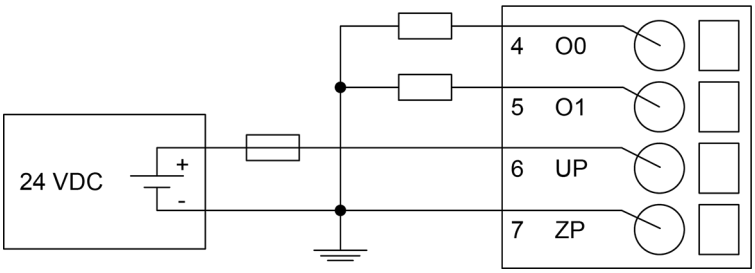


Fig. 148: Outputs of TA5110-2DI2DOT

104.5 Wiring

Proper wires and tools

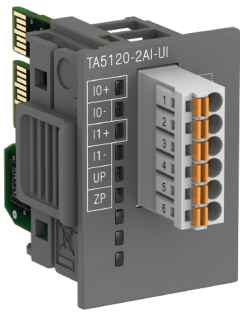
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
> **Risk of damaging the device**
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

105 TA5120-2AI-UI(W) - Option board for analog I/O extension

- TA5120-2AI-UI
- TA5120-2AI-UIW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

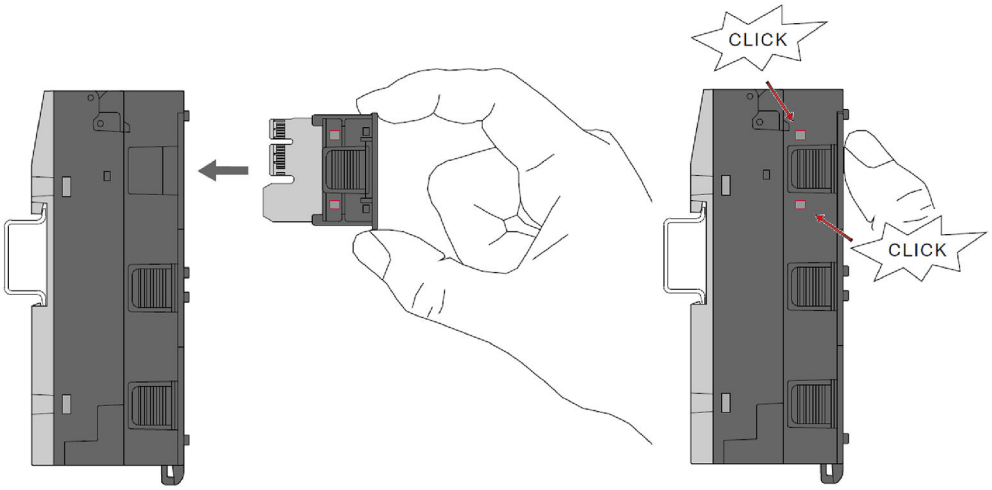
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

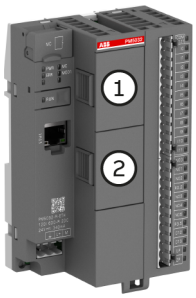
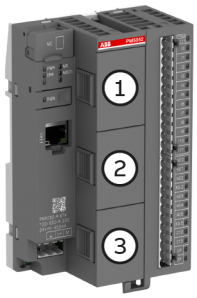
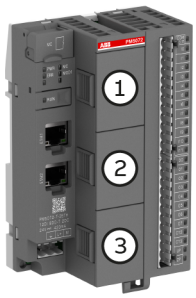
105.1 Assembly



105.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 80: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

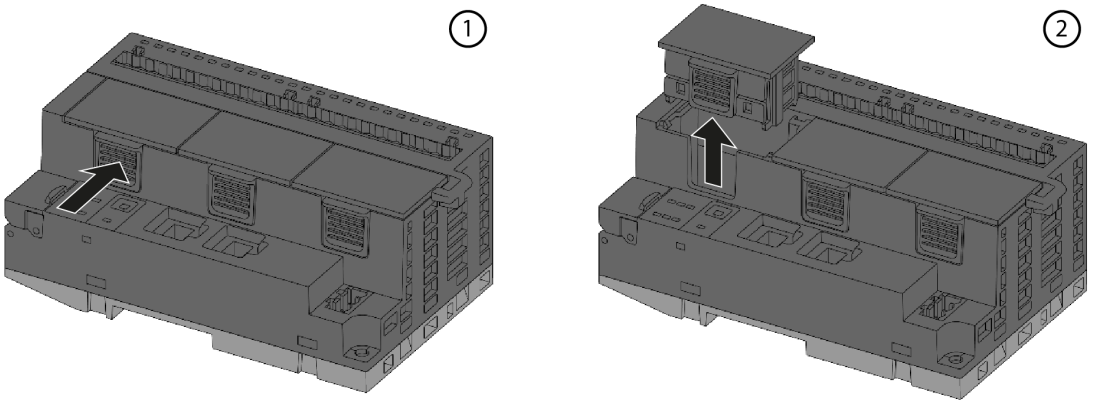
The optimized mounting position can be easily determined with the help of this table.

Table 81: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

105.2 Disassembly



CAUTION!

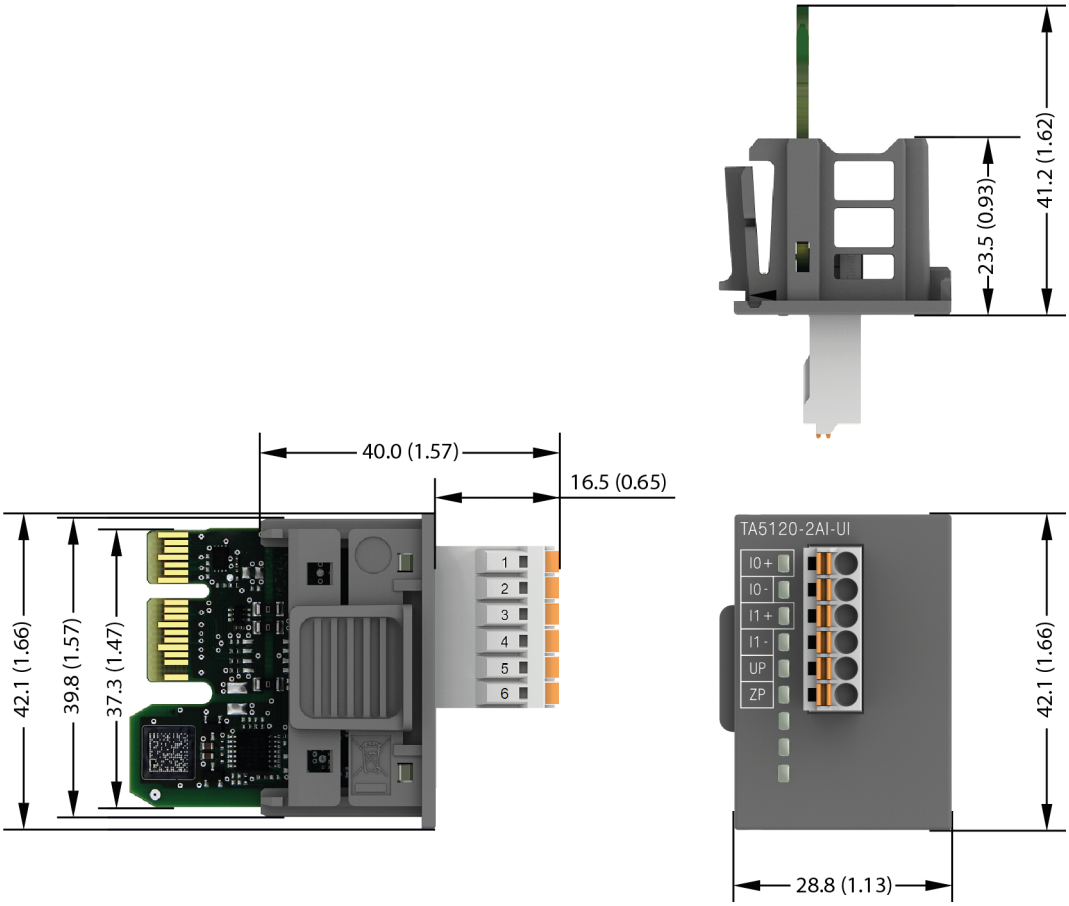
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

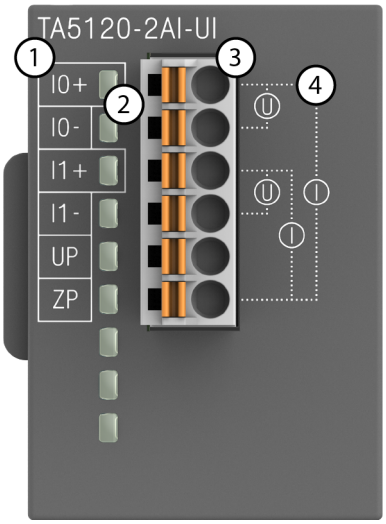
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

105.3 Dimensions



The dimensions are in mm and in brackets in inch.

105.4 Connections



1 Allocation of terminal and signal name
2 2 yellow LEDs to display the signal states at the analog inputs I0 and I1
3 6-pin terminal block for analog input signals and power supply (UP, ZP)
4 Input connection diagram for U and I

The option board TA5120-2AI-UI for analog input extension is plugged into an processor module PM50xx. Insert the module and press it into the slot until it clicks into place.

The electrical connection is carried out by using a removable 6-pin terminal block. For more information, please refer to the chapter **TA52xx(-x) - Terminal block sets** ↬ *Chapter 119 “TA52xx(-x) - Terminal block sets” on page 774*.

Table 82: Assignment of the terminals:

Terminal	Signal	Description
1	I0+	Positive terminal of the analog input I0
2	I0-	Negative terminal of the analog input I0
3	I1+	Positive terminal of the analog input I1
4	I1-	Negative terminal of the analog input I1
5	UP	Process voltage UP = +24 V DC
6	ZP	Process voltage ZP = 0 V DC

CAUTION!
Analog sensors must be galvanically isolated against the ground. In order to avoid inaccuracy with the measuring results, the analog sensors should also be isolated against the power supply.

CAUTION!
The negative terminals of the analog inputs are electrically connected to each other. They form an "Analog Ground" signal for the module (AGND).

CAUTION!

There is no galvanic isolation between the analog circuitry and ZP/UP. Therefore, the analog sensors must be electrically isolated in order to avoid loops via the ground potential or the supply voltage (Voltage 0V...10 V).

For the open-circuit detection (wire break), each analog input channel is pulled up to "plus" by a high-resistance resistor. If nothing is connected, the maximum voltage will be read in then.

The internal power supply voltage for the module's circuitry is carried out via the connection to CPU. Thus, the current consumption from 24 V DC power supply at the terminals L+ and M of the CPU module increases by << 1 mA per TA5120-2AI-UI.

The external power supply connection is carried out via the terminals UP (+24 V DC) and ZP (0 V DC).

WARNING!

Removal/Insertion under power

The option cards are not designed to be removed or inserted while the device is switched on. Due to unpredictable consequences, it is not permitted to connect or remove option cards while the device is powered on.

Make sure that all power sources (supply and process power) are switched off before you do the following:

– Connection or disconnection of signals or terminal blocks.
– Removal, installation or replacement of an option card.

Disconnecting a powered option card under voltage in a potentially explosive atmosphere may result in an electric arc, which could ignite combustible materials and cause a fire or explosion.

Make sure that the power supply is disconnected and the area has been toughly checked to ensure that no combustible materials are present before proceeding.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

Generally, analog signals must be laid in shielded cables. The cable shields must be grounded at both sides of the cables. To avoid unacceptable potential differences between different parts of the installation, low resistance equipotential bonding conductors must be laid.

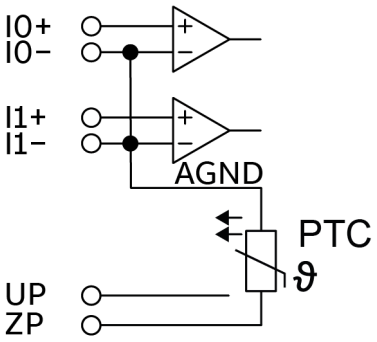


Fig. 149: Internal construction of the analog inputs

CAUTION!
By installing equipotential bonding conductors between the different parts of the system, it must be ensured that the potential difference between ZP and AGND never can exceed 1 V.

CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

105.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!
Risk of damaging the device
Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

106 TA5122-2AI-TC(W) - Option board for analog I/O extension

- TA5122-2AI-TC
- TA5122-2AI-TCW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

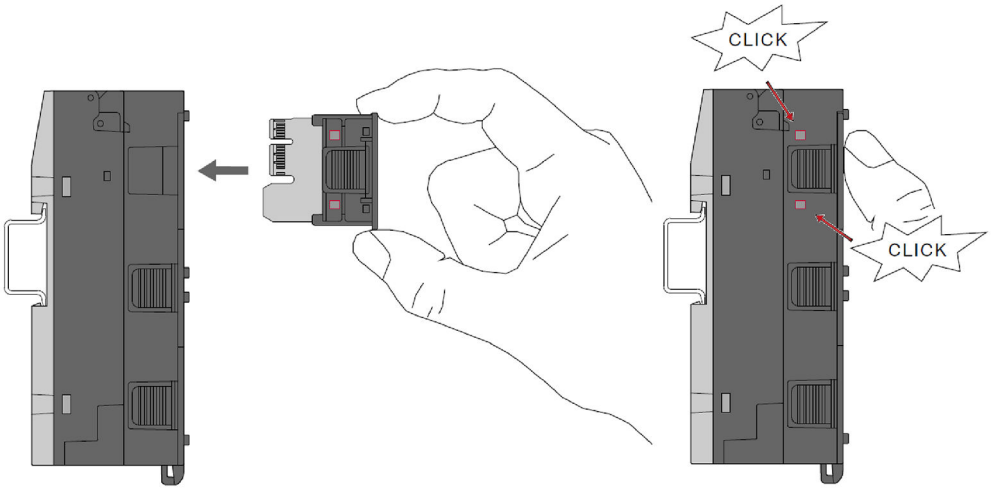
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

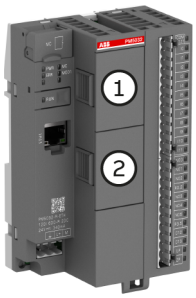
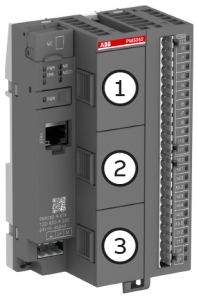
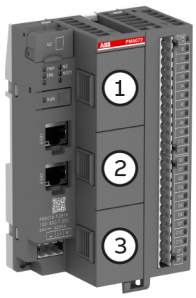
106.1 Assembly



106.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 83: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

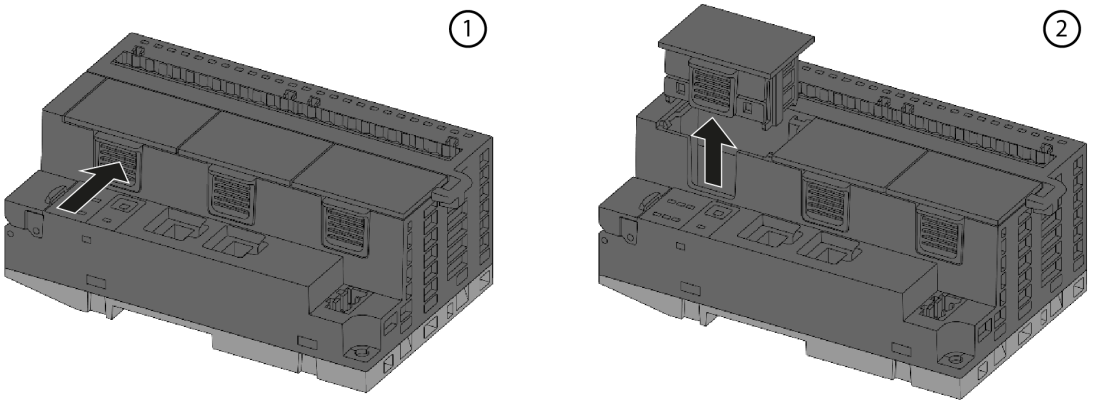
The optimized mounting position can be easily determined with the help of this table.

Table 84: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

106.2 Disassembly

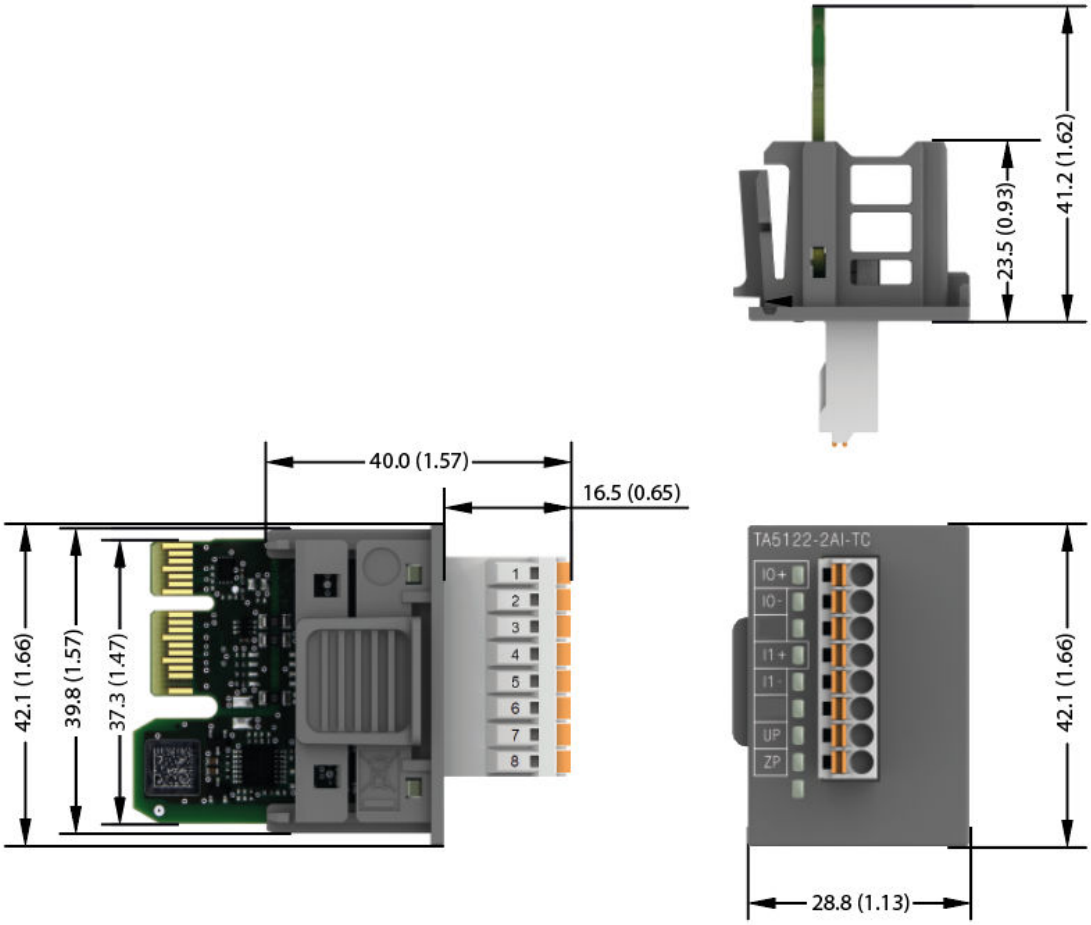


CAUTION!
Risk of injury and damaging the product!
Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

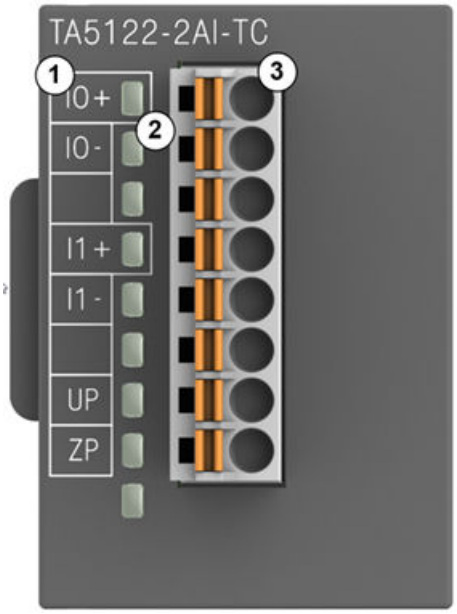
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

106.3 Dimensions



The dimensions are in mm and in brackets in inch.

106.4 Connections



1 Allocation of signal name
2 2 yellow LEDs to display the signal states at the analog inputs I0 and I1
3 8-pin terminal block for analog input signals and power supply (UP, ZP)

WARNING!

Removal/Insertion under power

The option cards are not designed to be removed or inserted while the device is switched on. Due to unpredictable consequences, it is not permitted to connect or remove option cards while the device is powered on.

Make sure that all power sources (supply and process power) are switched off before you do the following:

– Connection or disconnection of signals or terminal blocks.
– Removal, installation or replacement of an option card.

Disconnecting a powered option card under voltage in a potentially explosive atmosphere may result in an electric arc, which could ignite combustible materials and cause a fire or explosion.

Make sure that the power supply is disconnected and the area has been toughly checked to ensure that no combustible materials are present before proceeding.

The option board TA5122-2AI-TC for analog input extension is plugged into a processor module PM50x2.

Insert the module and press it until it locks into place. A detailed description of the assembly and disassembly of the module can be found in the chapter **Mounting and demounting option boards**.

The electrical connection is made via a removable 8-pin terminal block. For more information, please refer to the chapter **TA52xx(-x) - Terminal block sets**. One terminal block is included in the scope of delivery of the module. Additional terminal blocks can be ordered separately as spare parts.

Table 85: Assignment of the terminals:

Terminal	Signal	Description
1	I0+	Positive analog input I0
2	I0-	Negative analog input I0
4	I1+	Positive analog input I1
5	I1-	Negative analog input I1
7	UP	Process voltage UP = +24 V DC
8	ZP	Process voltage ZP = 0 V

NOTICE!

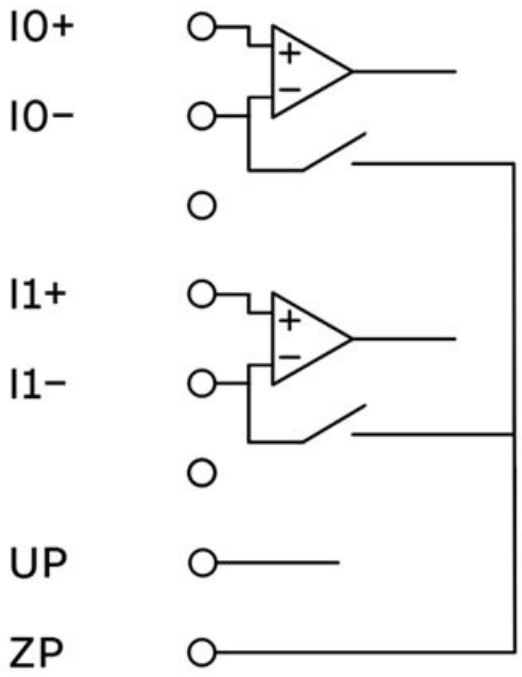
Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

Generally, analog signals must be laid in shielded cables. The cable shields must be grounded at both sides of the cables. To avoid unacceptable potential differences between different parts of the installation, low resistance equipotential bonding conductors must be laid.

The following block diagram shows the internal construction of the analog inputs:



CAUTION!

By installing equipotential bonding conductors between the different parts of the system, it must be ensured that the potential difference between ZP and AGND never can exceed 1 V.



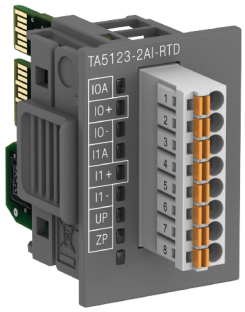
CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal ZP).

The module provides several diagnosis functions, see Diagnosis .

The meaning of the LEDs is described in the section State LEDs .

107 TA5123-2AI-RT(D/W) - Option board for analog I/O extension

- TA5123-2AI-RTD
- TA5123-2AI-RTW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

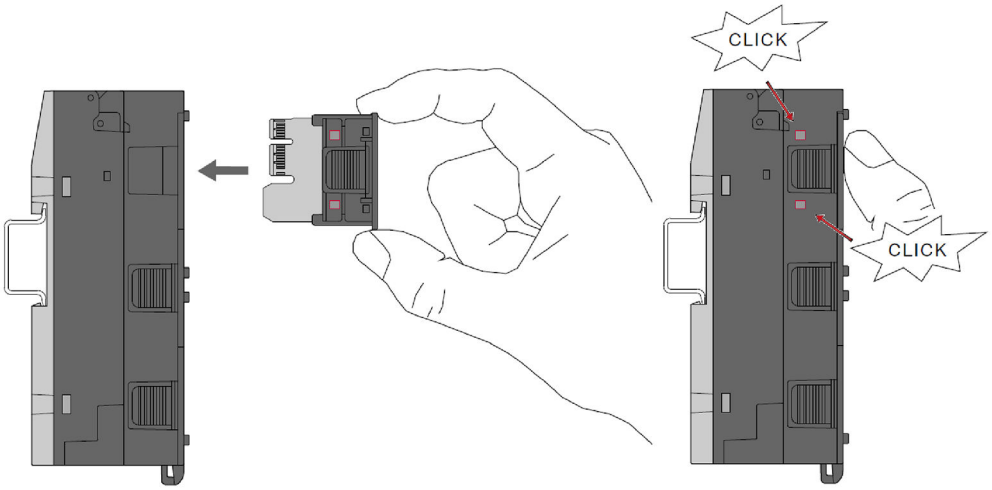
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

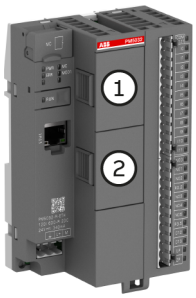
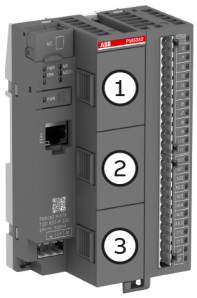
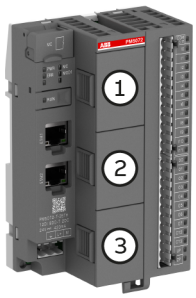
107.1 Assembly



107.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 86: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

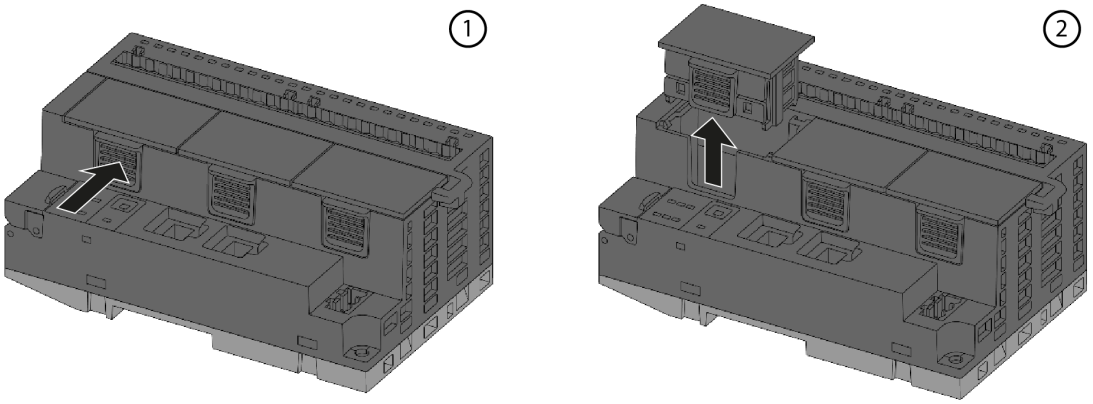
The optimized mounting position can be easily determined with the help of this table.

Table 87: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

107.2 Disassembly



CAUTION!

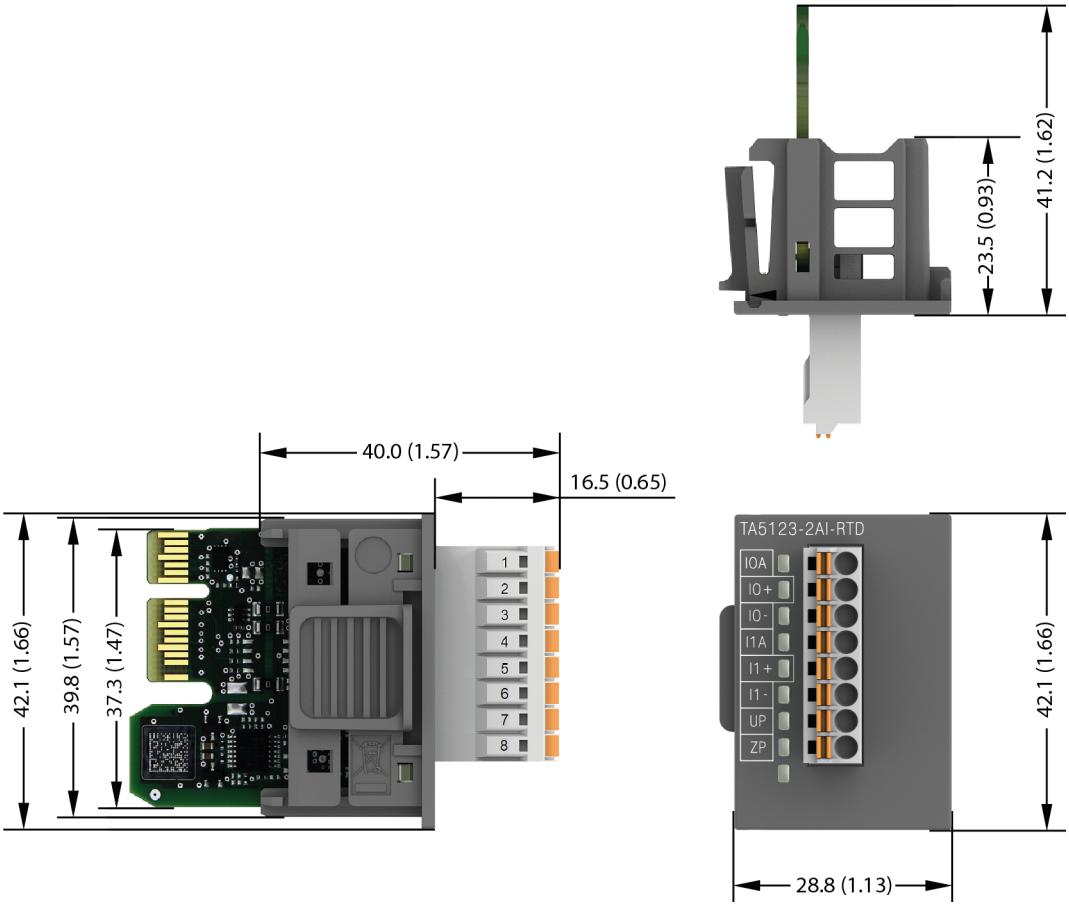
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

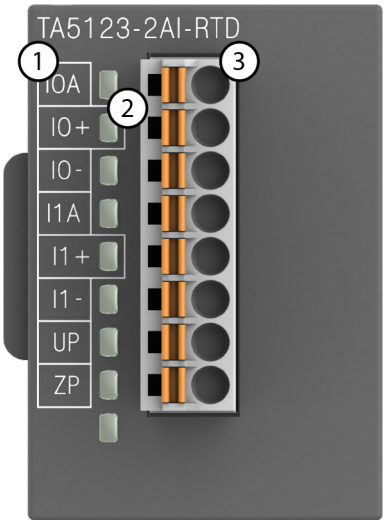
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

107.3 Dimensions



The dimensions are in mm and in brackets in inch.

107.4 Connections



1 Allocation of signal name
2 2 yellow LEDs to display the signal states at the analog inputs I0 and I1
3 8-pin terminal block for analog input signals and power supply (UP, ZP)

The option board TA5123-2AI-RTD for analog input extension is plugged into a processor module PM50x2. Insert the module and press it until it locks into place.

The electrical connection is carried out by using a removable 8-pin terminal block. For more information, please refer to the chapter **TA52xx(-x) - Terminal block sets** *Chapter 119 “TA52xx(-x) - Terminal block sets” on page 774*.

Table 88: Assignment of the terminals:

Terminal	Signal	Description
1	I0A	Connection A (supply) of the analog input I0
2	I0+	Positive terminal of the analog input I0
3	I0-	Negative terminal of the analog input I0
4	I1A	Connection A (supply) of the analog input I1
5	I1+	Positive terminal of the analog input I1
6	I1-	Negative terminal of the analog input I1
7	UP	Process voltage UP = +24 VDC
8	ZP	Process voltage ZP = 0 V

CAUTION!
Analog sensors must be galvanically isolated against the ground. In order to avoid inaccuracy with the measuring results, the analog sensors should also be isolated against the power supply.

CAUTION!
The negative terminals of the analog inputs are electrically connected to each other. They form an "Analog Ground" signal for the module.

CAUTION!
There is no galvanic isolation between the analog circuitry and ZP/UP. Therefore, the analog sensors must be electrically isolated in order to avoid loops via the earth potential or the supply voltage.

For the open-circuit detection (wire break), each analog input channel is pulled up to "plus" by a high-resistance resistor. If nothing is connected, the maximum voltage will be read in then.

The internal power supply voltage for the module's circuitry is carried out via the connection to CPU. Thus, the current consumption from 24 VDC power supply at the terminals L+ and M of the CPU module increases by << 1 mA per TA5123-2AI-RTD.

The external power supply connection is carried out via the UP (+24 VDC) and the ZP (0 VDC) terminals.

WARNING!
Removal/Insertion under power
The option cards are not designed to be removed or inserted while the device is switched on. Due to unpredictable consequences, it is not permitted to connect or remove option cards while the device is powered on.

Make sure that all power sources (supply and process power) are switched off before you do the following:

– Connection or disconnection of signals or terminal blocks.
– Removal, installation or replacement of an option card.

Disconnecting a powered option card under voltage in a potentially explosive atmosphere may result in an electric arc, which could ignite combustible materials and cause a fire or explosion.

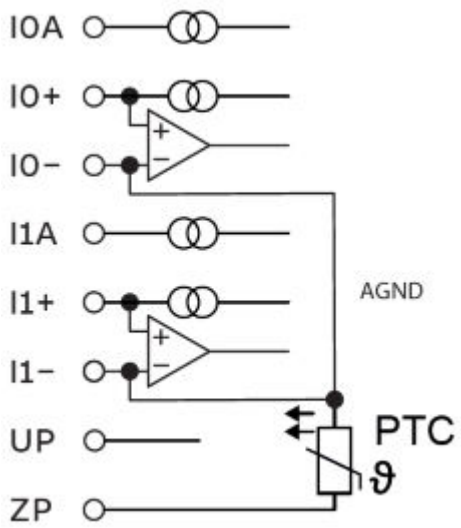
Make sure that the power supply is disconnected and the area has been toughly checked to ensure that no combustible materials are present before proceeding.

NOTICE!
Risk of damaging the PLC modules!
Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

Generally, analog signals must be laid in shielded cables. The cable shields must be grounded at both sides of the cables. To avoid unacceptable potential differences between different parts of the installation, low resistance equipotential bonding conductors must be laid.

The following block diagram shows the internal construction of the analog inputs:



CAUTION!
By installing equipotential bonding conductors between the different parts of the system, it must be ensured that the potential difference between ZP and AGND never can exceed 1 V.

CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

107.5 Wiring

Proper wires and tools

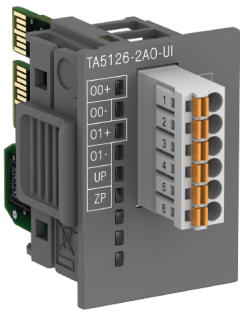
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!
Risk of damaging the device
Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

108 TA5126-2AO-UI(W) - Option board for analog I/O extension

- TA5126-2AO-UI
- TA5126-2AO-UIW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

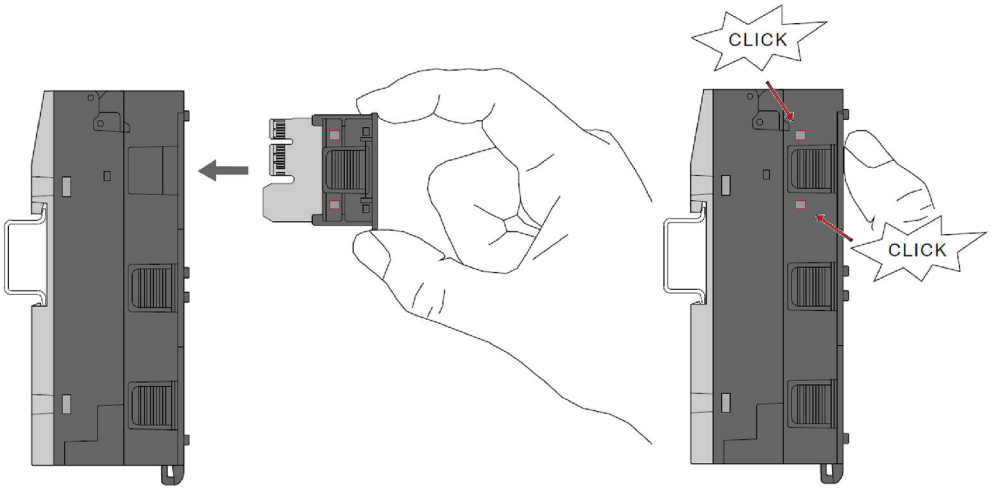
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

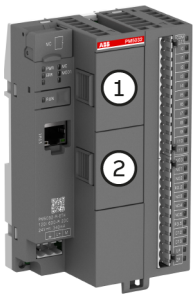
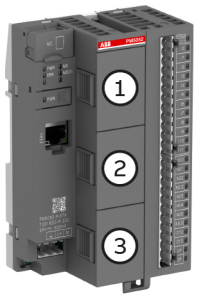
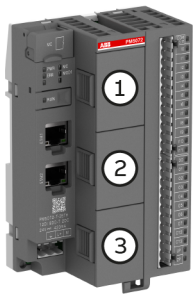
108.1 Assembly



108.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 89: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

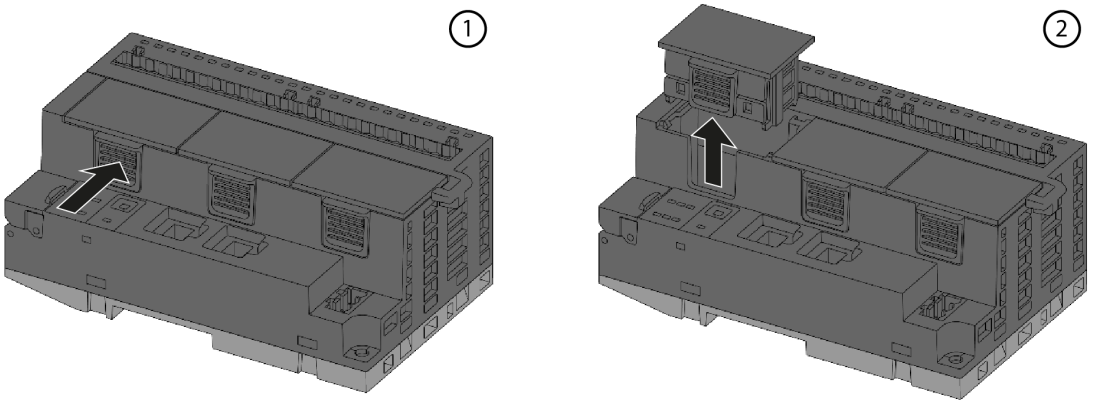
The optimized mounting position can be easily determined with the help of this table.

Table 90: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

108.2 Disassembly

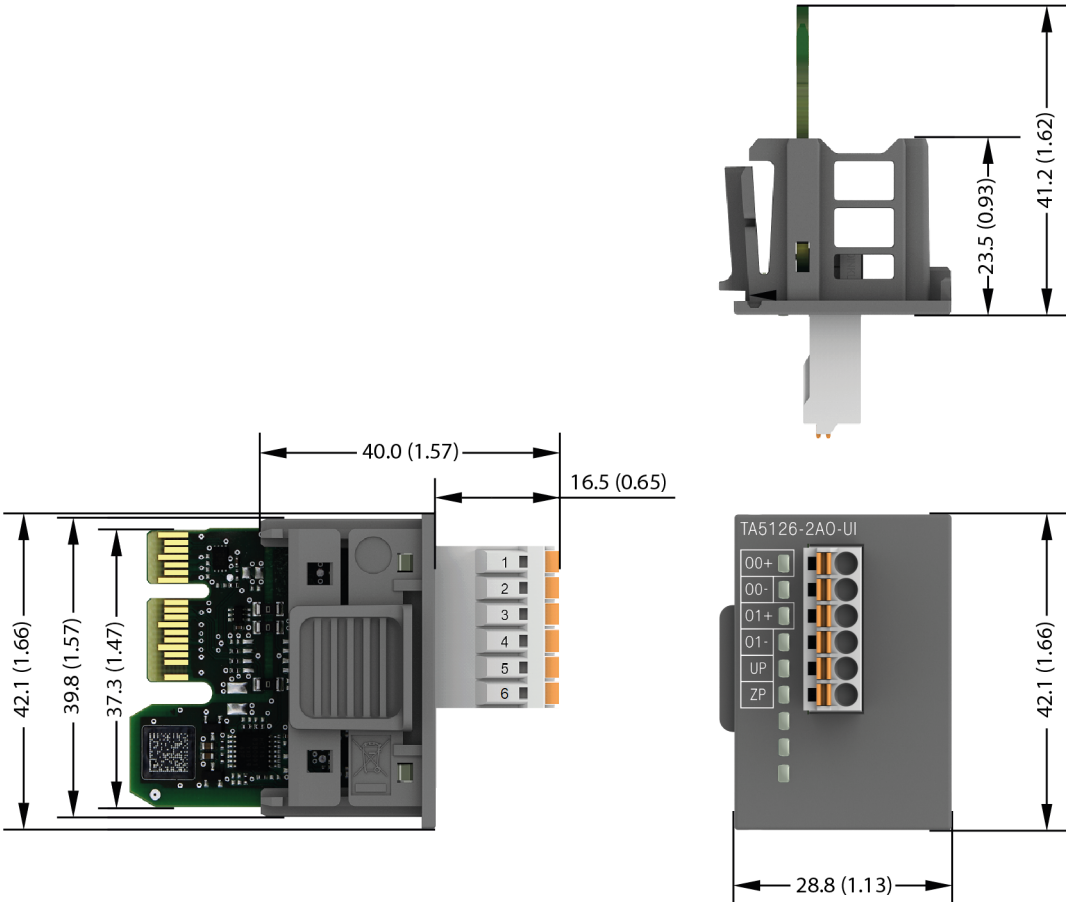


CAUTION!
Risk of injury and damaging the product!
Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

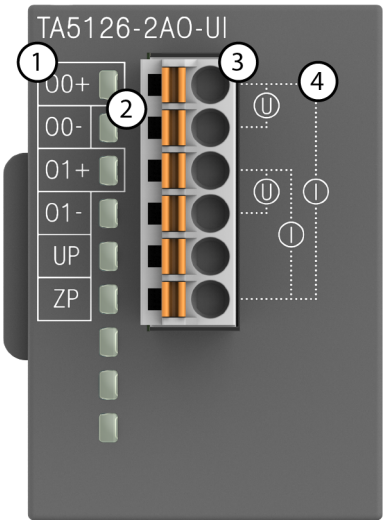
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

108.3 Dimensions



The dimensions are in mm and in brackets in inch.

108.4 Connections



1 Allocation of signal name
2 2 yellow LEDs to display the signal states at the analog outputs O0 and O1
3 6-pin terminal block for analog output signals and power supply (UP, ZP)
4 Output connection diagram for U and I

The option board TA5126-2AO-UI for analog output extension is plugged into a processor module PM50xx. Insert the module and press it into the slot until it clicks into place.

The electrical connection is carried out by using a removable 6-pin terminal block. For more information, please refer to the chapter **TA52xx(-x) - Terminal block sets** *Chapter 119 “TA52xx(-x) - Terminal block sets” on page 774*.

Table 91: Assignment of the terminals:

Terminal	Signal	Description
1	O0+	Positive terminal of the analog output O0
2	O0-	Negative terminal of the analog output O0
3	O1+	Positive terminal of the analog output O1
4	O1-	Negative terminal of the analog output O1
5	UP	Process voltage UP = +24 V DC
6	ZP	Process voltage ZP = 0 V DC

CAUTION!
Analog sensors must be galvanically isolated against the ground. In order to avoid inaccuracy with the measuring results, the analog sensors should also be isolated against the power supply.

CAUTION!
The negative terminals of the analog inputs are electrically connected to each other. They form an "Analog Ground" signal for the module (AGND).

CAUTION!

There is no galvanic isolation between the analog circuitry and ZP/UP. Therefore, the analog sensors must be electrically isolated in order to avoid loops via the ground potential or the supply voltage (Voltage 0V...10 V).

For the open-circuit detection (wire break), each analog input channel is pulled up to "plus" by a high-resistance resistor. If nothing is connected, the maximum voltage will be read in then.

The internal power supply voltage for the module's circuitry is carried out via the connection to CPU. Thus, the current consumption from 24 V DC power supply at the terminals L+ and M of the CPU module increases by << 1 mA per TA5126-2AO-UI.

The external power supply connection is carried out via the terminals UP (+24 V DC) and ZP (0 V DC).

WARNING!

Removal/Insertion under power

The option cards are not designed to be removed or inserted while the device is switched on. Due to unpredictable consequences, it is not permitted to connect or remove option cards while the device is powered on.

Make sure that all power sources (supply and process power) are switched off before you do the following:

– Connection or disconnection of signals or terminal blocks.
– Removal, installation or replacement of an option card.

Disconnecting a powered option card under voltage in a potentially explosive atmosphere may result in an electric arc, which could ignite combustible materials and cause a fire or explosion.

Make sure that the power supply is disconnected and the area has been toughly checked to ensure that no combustible materials are present before proceeding.

NOTICE!

Risk of damaging the PLC modules!

Overvoltages and short circuits might damage the PLC modules.

Make sure that all voltage sources (supply voltage and process supply voltage) are switched off before you begin with operations on the system.

Generally, analog signals must be laid in shielded cables. The cable shields must be grounded at both sides of the cables. To avoid unacceptable potential differences between different parts of the installation, low resistance equipotential bonding conductors must be laid.

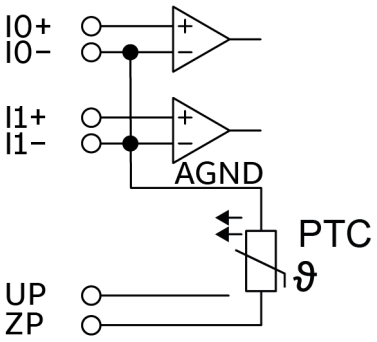


Fig. 150: Internal construction of the analog inputs

CAUTION!
By installing equipotential bonding conductors between the different parts of the system, it must be ensured that the potential difference between ZP and AGND never can exceed 1 V.

CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

108.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!
Risk of damaging the device
Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

109 TA5128-2AI1AO(W) - Option board for analog input/output extension

- TA5128-2AI1AO
- TA5128-2AI1AOW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

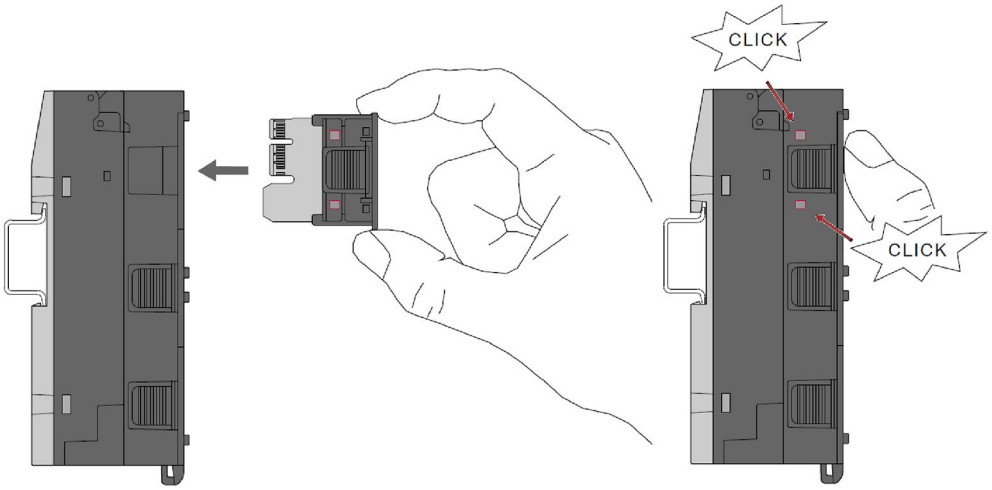
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

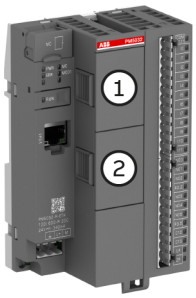
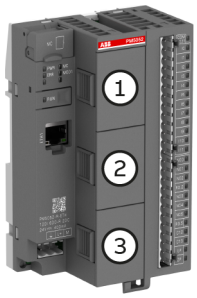
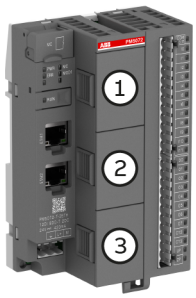
109.1 Assembly



109.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 92: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

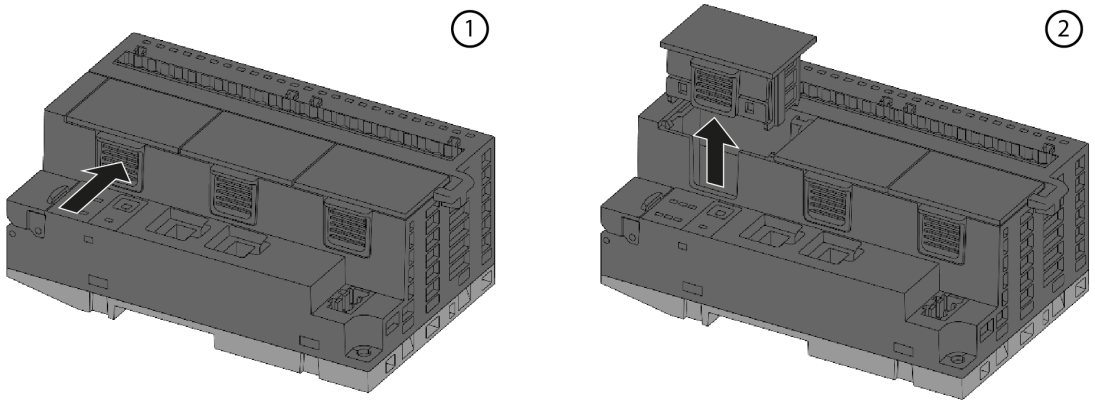
The optimized mounting position can be easily determined with the help of this table.

Table 93: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

109.2 Disassembly



CAUTION!

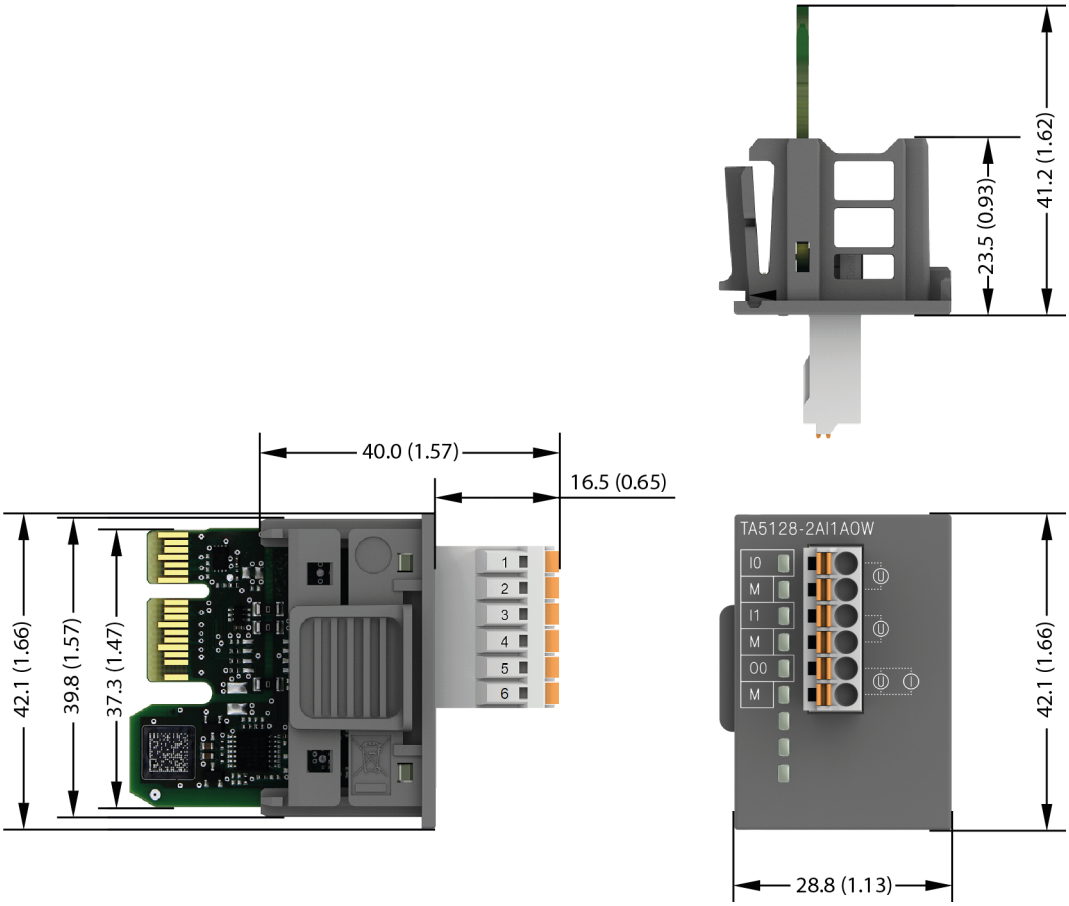
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

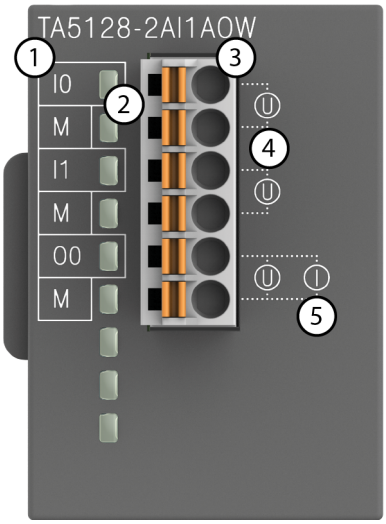
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

109.3 Dimensions



The dimensions are in mm and in brackets in inch.

109.4 Connections



1 Allocation of terminal and signal name
2 3 yellow LEDs to display the signal states at the analog inputs and analog output
3 6-pin terminal block for analog input/output signals
4 Input connection diagram for U
5 Output connection diagram for U and I

The option board TA5128-2AI1AO for analog input/output extension is plugged into a processor module PM50x2. Insert the module and press it until it locks into place.

The electrical connection is carried out by using a removable 6-pin terminal block. For more information, please refer to the chapter **TA52xx(-x) - Terminal block sets** ↬ *Chapter 119 “TA52xx(-x) - Terminal block sets” on page 774*.

Table 94: Assignment of the terminals:

Terminal	Signal	Description
1	I0	Analog input I0
2	M	Reference of analog input I0
3	I1	Analog input I1
4	M	Reference of analog input I1
5	O0	Analog output O0
6	M	Reference of analog output O0

CAUTION!
The negative terminal of the analog output (voltage 0 V…10 V) is connected internally to system power reference M.

The internal power supply of the circuits of the module takes place via the connection to the CPU. Thus, the current consumption from 24 V DC power supply at the terminals L+ and M of the CPU module increases by max. 25 mA per TA5128-2AI1AO.

NOTICE!
Risk of damaging the PLC modules!
Overvoltages and short circuits might damage the PLC modules.

Generally, analog signals must be laid in shielded cables. The cable shields must be grounded at both sides of the cables. To avoid unacceptable potential differences between different parts of the installation, low resistance equipotential bonding conductors must be laid.

The following figure shows the connection of the module:

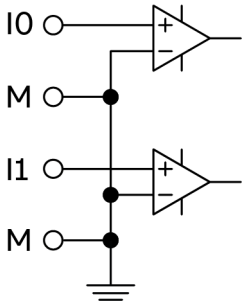


Fig. 151: Internal construction of the analog inputs

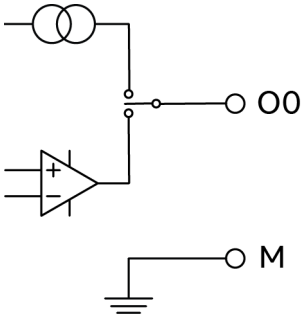


Fig. 152: Internal construction of the analog output

WARNING!

Removal/Insertion under power

The option cards are not designed to be removed or inserted while the device is switched on. Due to unpredictable consequences, it is not permitted to connect or remove option cards while the device is powered on.

Make sure that all power sources (supply and process power) are switched off before you do the following:

– Connection or disconnection of signals or terminal blocks.
– Removal, installation or replacement of an option card.

Disconnecting a powered option card under voltage in a potentially explosive atmosphere may result in an electric arc, which could ignite combustible materials and cause a fire or explosion.

Make sure that the power supply is disconnected and the area has been toughly checked to ensure that no combustible materials are present before proceeding.

109.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

110 TA5130-KNXPB(W) - Option board KNX address push button

- TA5130-KNXPB
- TA5130-KNXPBW for wide temperature range



TA5130-KNXPB(W) option board is only intended to be used with PM5072-T-2ETH(W).

This option board can only be used once per processor module.

This option board is not supported by other AC500-eCo processor modules.

CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

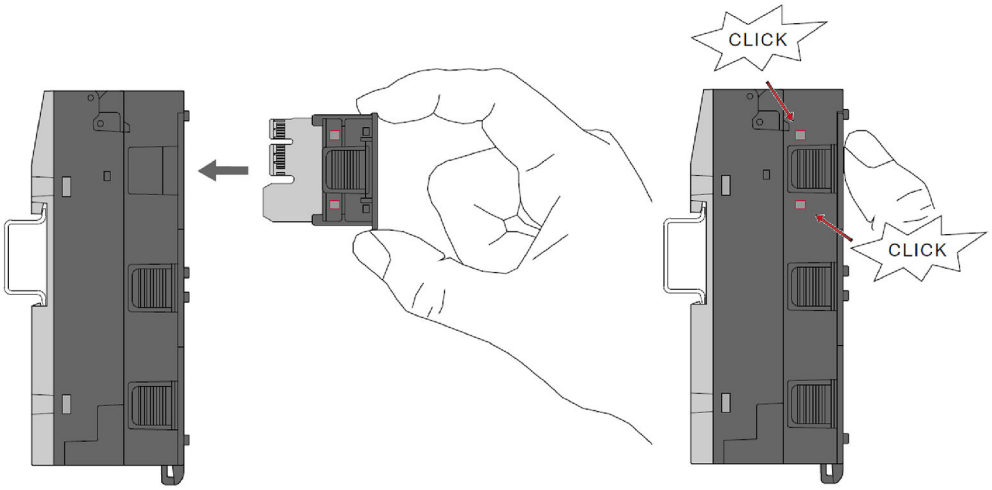
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

– ESD (electrostatic discharge) protection measures are required when handling the option board.
– Do not touch contacts and circuit board.

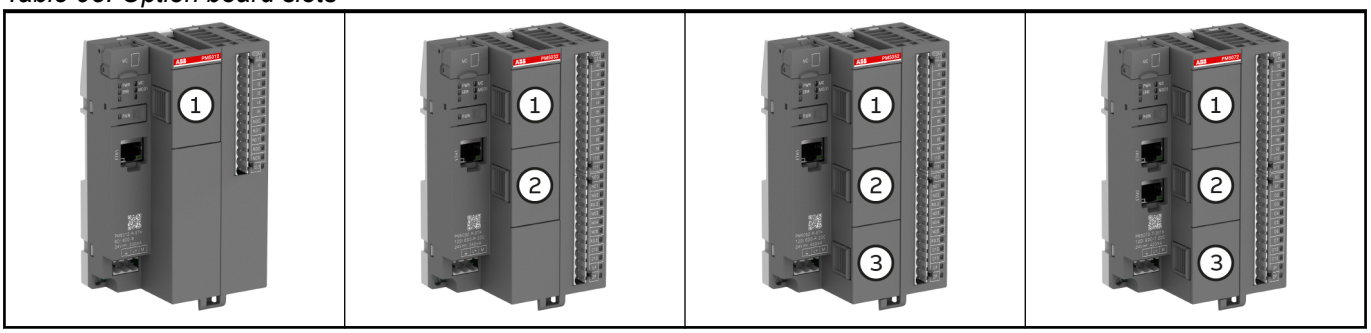
110.1 Assembly



110.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 95: Option board slots



The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

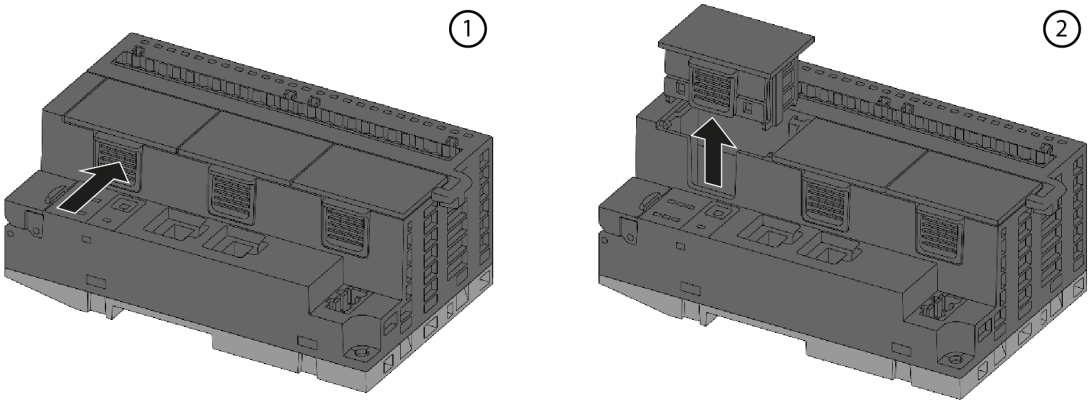
The optimized mounting position can be easily determined with the help of this table.

Table 96: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

110.2 Disassembly

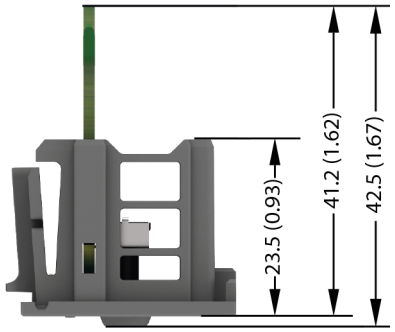


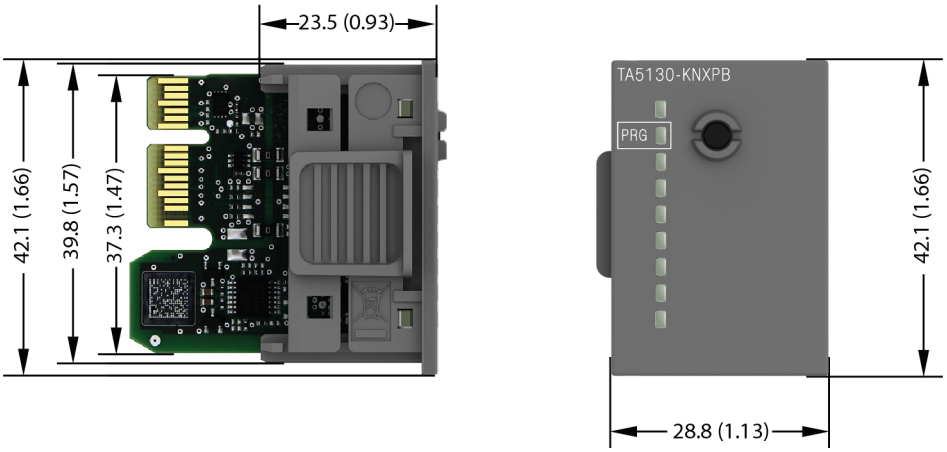
CAUTION!
Risk of injury and damaging the product!
Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

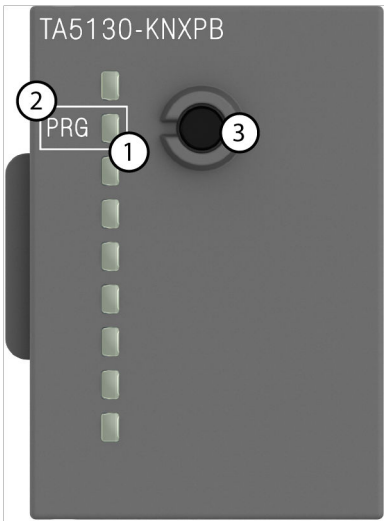
110.3 Dimensions





The dimensions are in mm and in brackets in inch.

110.4 Connections



1 State LED
2 Allocation of signal name
3 Push-Button

110.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

111 TA5131-RTC - Option board for real-time clock

- TA5131-RTC



This option board is only for the Basic processor modules PM5012-T-ETH and PM5012-R-ETH.

All other AC500-eCo processor modules have the real-time clock already integrated.

CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

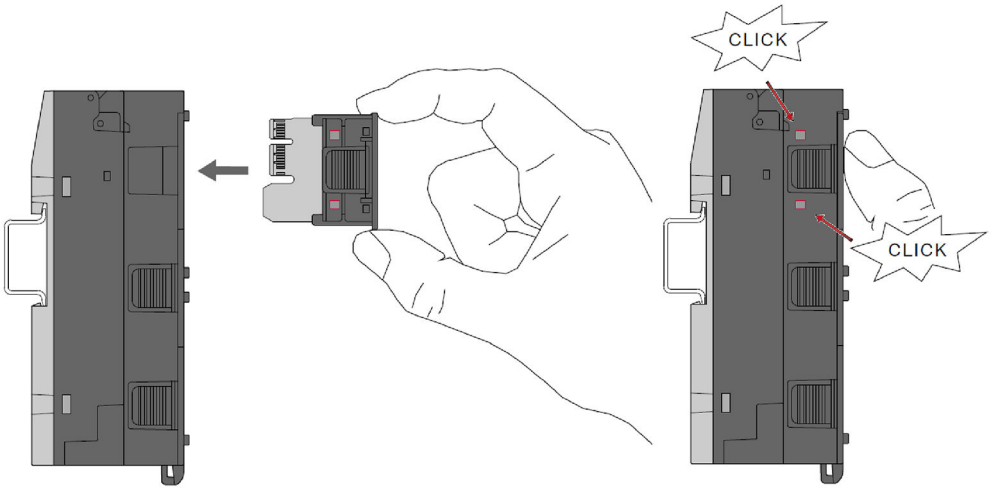
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

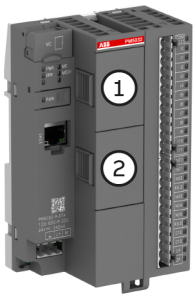
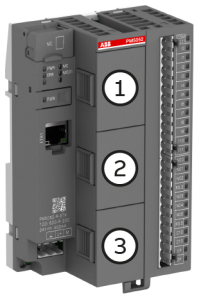
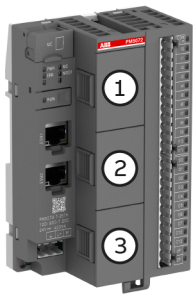
111.1 Assembly



111.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 97: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

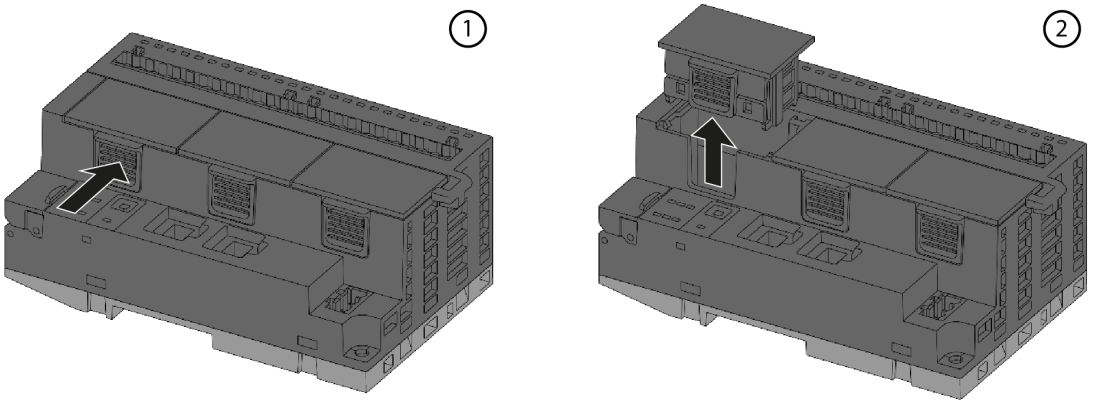
The optimized mounting position can be easily determined with the help of this table.

Table 98: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

111.2 Disassembly



CAUTION!

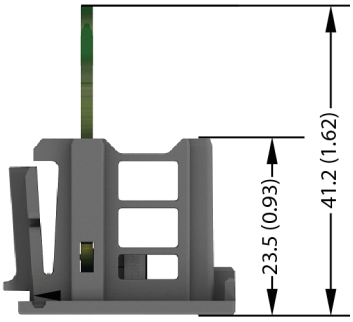
Risk of injury and damaging the product!

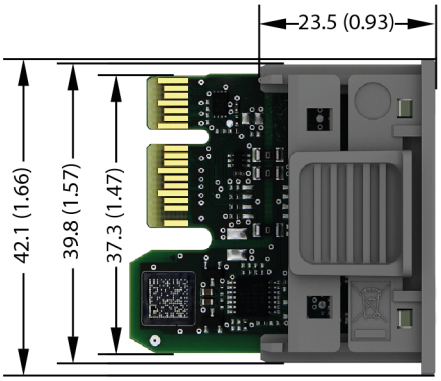
Always plug in the option board slot cover when the option board is not inserted.

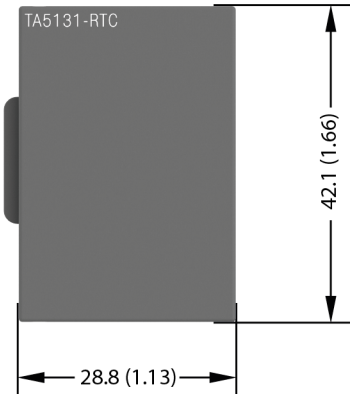
If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

111.3 Dimensions







The dimensions are in mm and in brackets in inch.

111.4 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

112 TA514-SAFETY

- TA514-SAFETY



WARNING!

Risk of injury and damaging the product!

This training case is only intended to be used by skilled persons aware of the risks using electrical equipment and knowing the technical rules, codes and relevant standards.

WARNING!

Risk of injury and damaging the product!

- Only use the training case with the delivered power supply adapter
- Only use the training case for demonstration and training activities
- The operating temperature for training case is 0 °C … + 40°C
- This training case is a class A device for EMC, because the main components (e.g. PLC) inside are designed for industrial applications. It can cause radio-interference in residential areas.

112.1 Assembly

1. Take out the power adapter



2. Connect the AC power cable



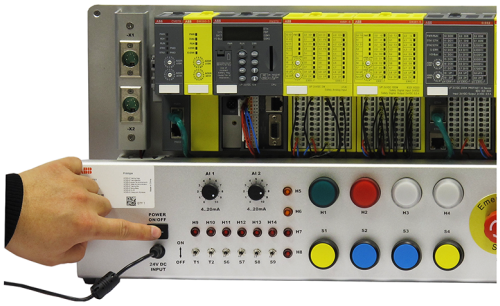
3. Connect the power adapter to socket 24 V DC input



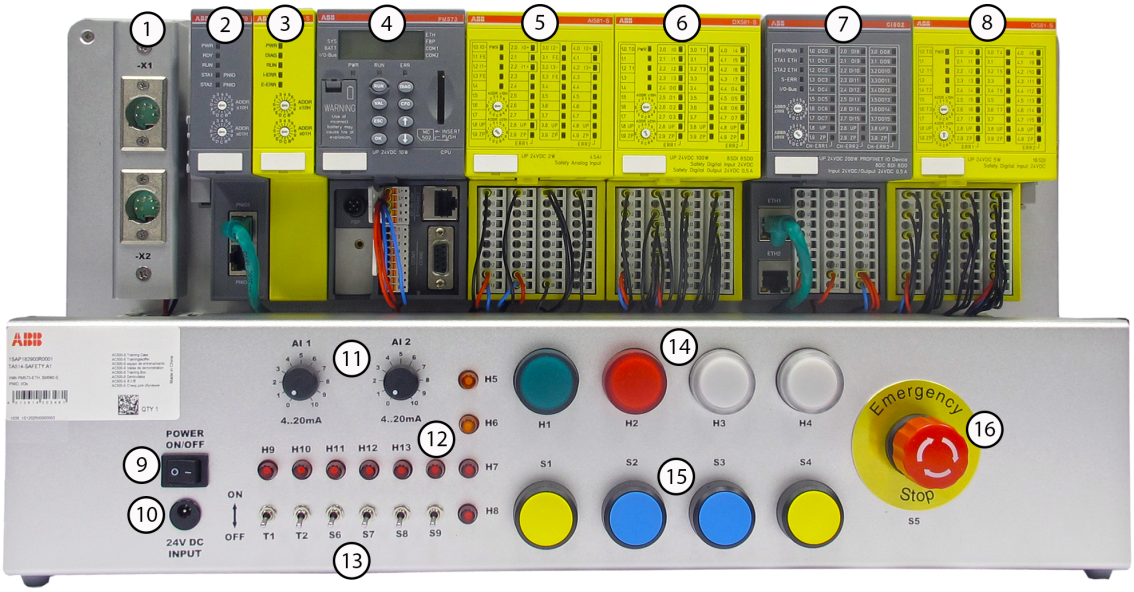
4. Connect AC power to socket



5. Switch on the power



112.2 Connections



1 Light curtain interface socket (2-channel)
2 Communication module CM579-PNIO
3 Safety CPU SM560-S
4 CPU unit PM573-ETH
5 Safety analog input module AI581-S
6 Digital safety I/O module DX581-S
7 PROFINETcommunication interface module CI502-PNIO
8 Safety digital input module DI581-S
9 24 V DC On/Off switch
10 24 V DC Power Supply
11 Analog potentiometer
12 Indicating LEDs
13 Switches for input simulation
14 Indicating lamps
15 Buttons for input simulation
16 Emergency Stop button

113 TA5141-RS232I(W) - Option board for COMx serial communication

- TA5141-RS232I
- TA5141-RS232IW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

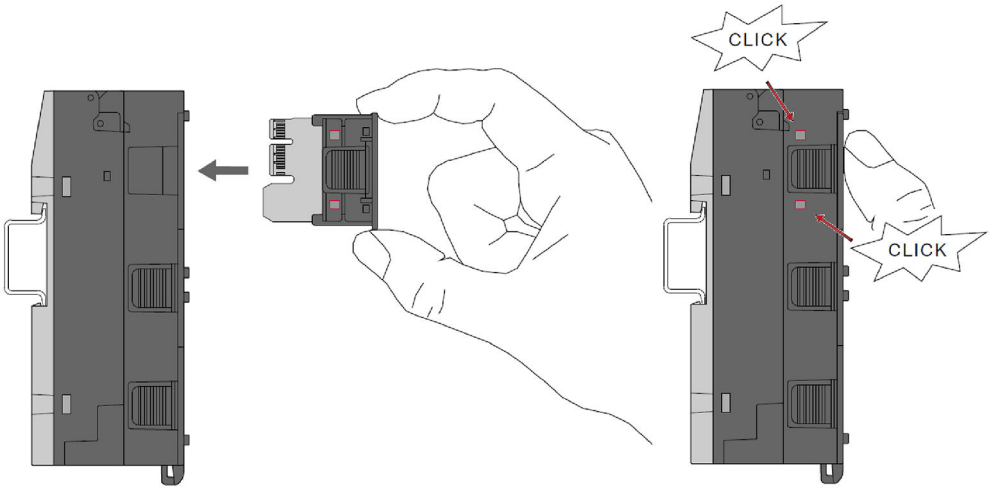
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

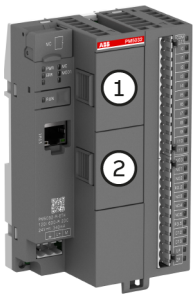
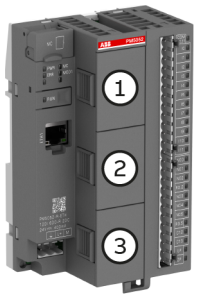
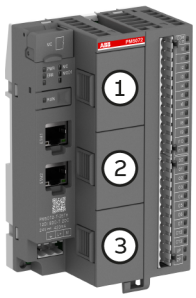
113.1 Assembly



113.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 99: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

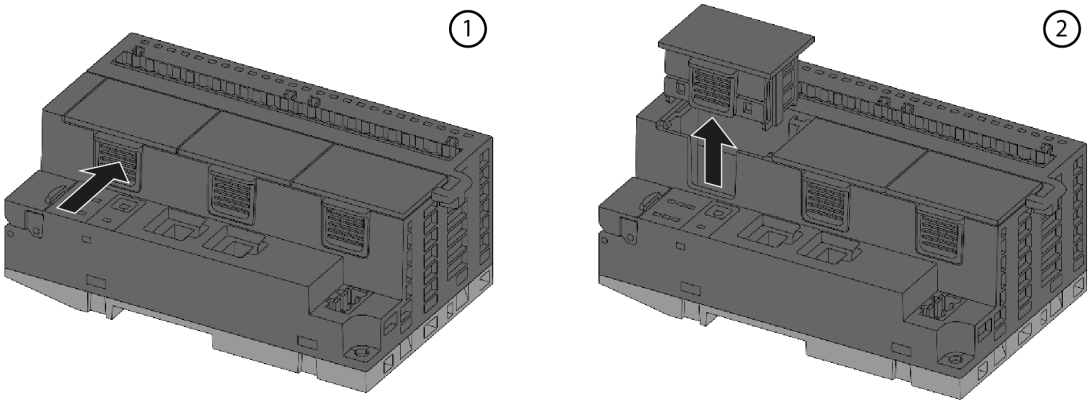
The optimized mounting position can be easily determined with the help of this table.

Table 100: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

113.2 Disassembly



CAUTION!

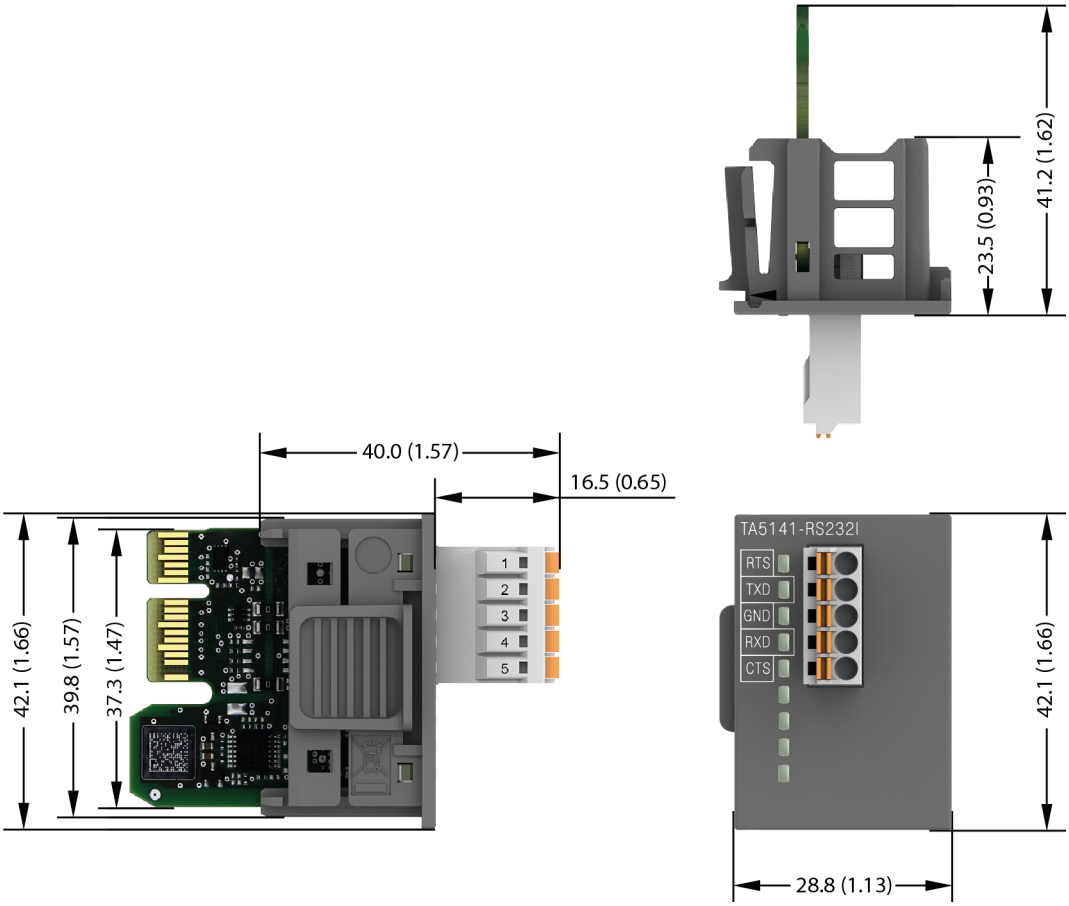
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

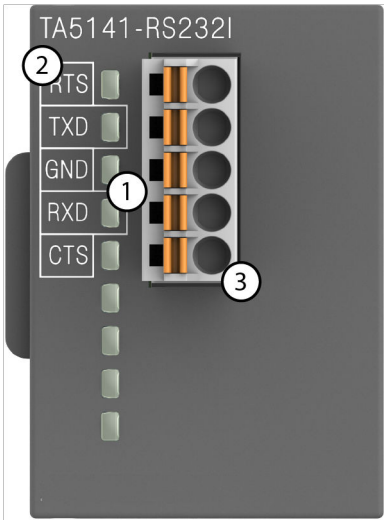
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

113.3 Dimensions



The dimensions are in mm and in brackets in inch.

113.4 Connections



1 2 LEDs for communication state display (TxD and RxD)
2 Allocation of signal name
3 5-pin terminal block for communication interface

113.4.1 Serial interface

Serial interface RS232I

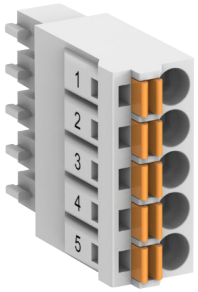
NOTICE!

Damage to the serial communication interface by using 5-pin terminal block of the TA5101-4DI!

If the 5-pin terminal block of the TA5101-4DI option board is plugged into a option board for COMx serial communication TA5141-RS232I, TA5142-RS485I or TA5142-RS485, the communication interface will be damaged by the 24 V.

Please do not confuse the 5-pin terminal block of the TA5101-4DI with the 5-pin terminal block for serial communication interface of TA5141-RS232I, TA5142-RS485I or TA5142-RS485.

Table 101: TA5141-RS232I

Serial interface	Pin	Signal	Description
	1	RTS	Request To Send DCE is ready to accept data from the DTE
	2	TxD	Transmit data (output)
	3	GND	Common Ground
	4	RxD	Receive data (input)
	5	CTS	Clear To Send (input) DCE is ready to accept data from the DTE

113.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

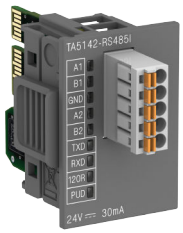
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

114 TA5142-RS485(I)(W) - Option board for COMx serial communication

- TA5142-RS485
- TA5142-RS485I
- TA5142-RS485W for wide temperature range
- TA5142-RS485IW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

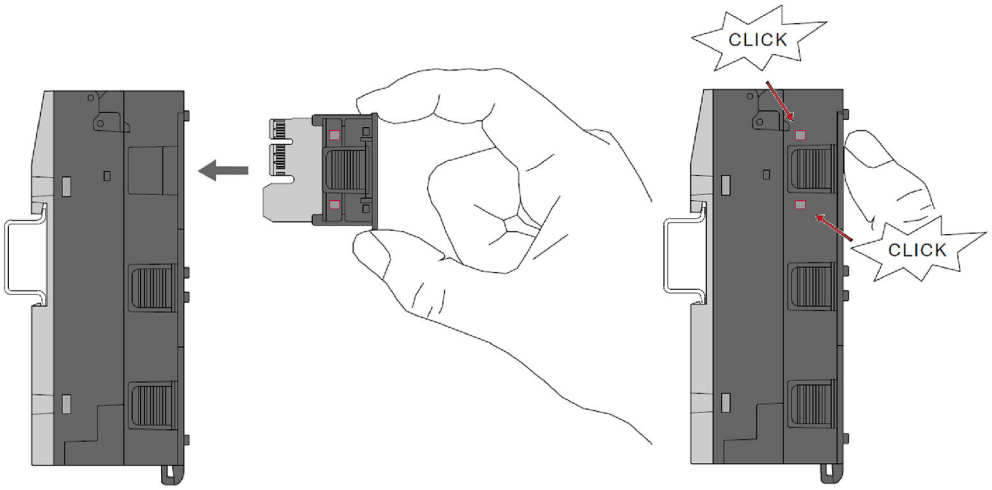
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

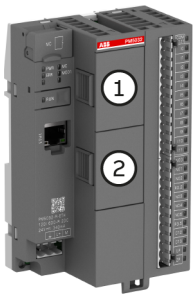
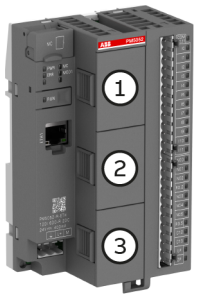
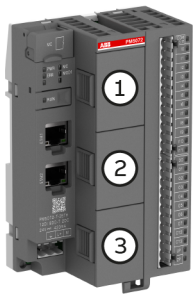
114.1 Assembly



114.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 102: Option board slots

The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

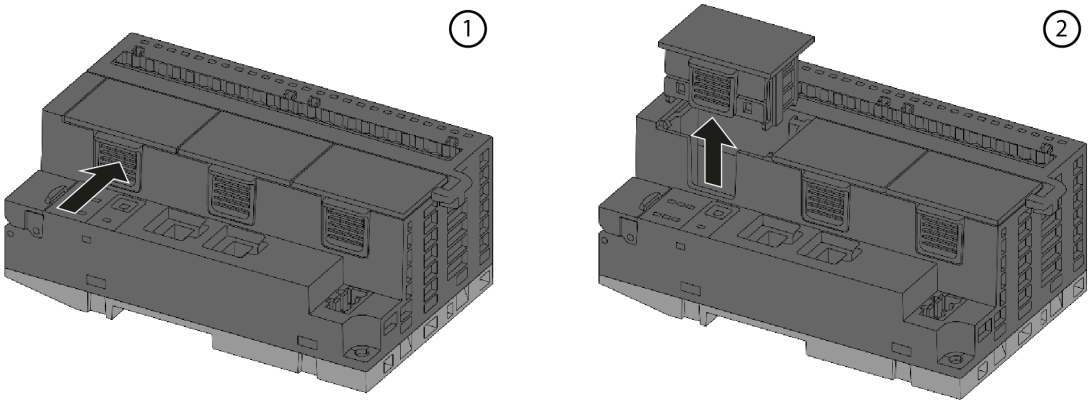
The optimized mounting position can be easily determined with the help of this table.

Table 103: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

114.2 Disassembly



CAUTION!

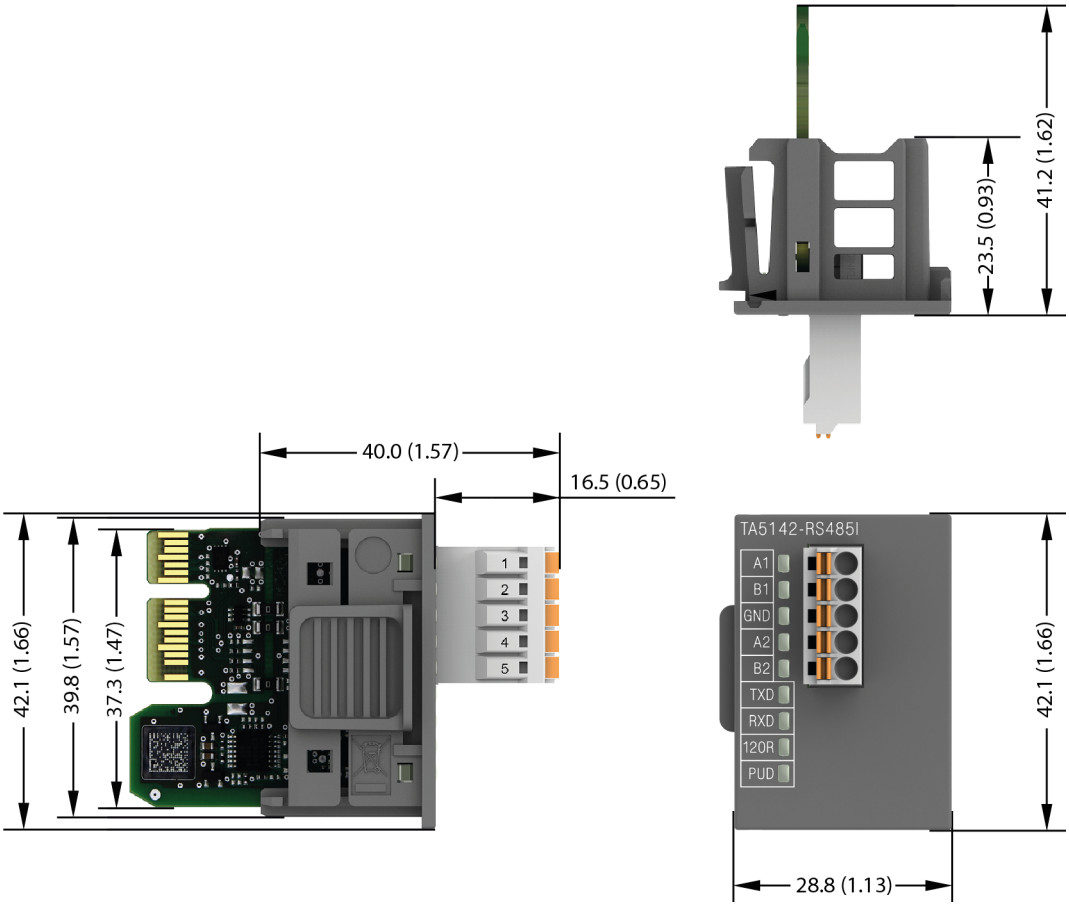
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

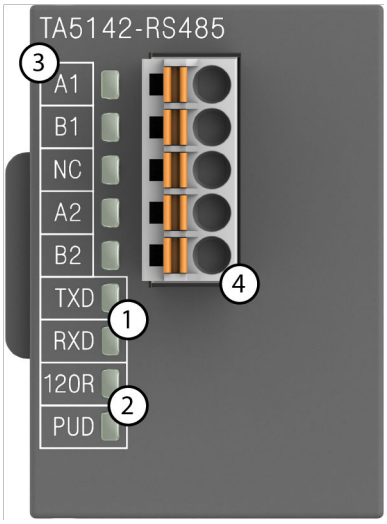
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

114.3 Dimensions



The dimensions are in mm and in brackets in inch.

114.4 Connections



1 2 LEDs for communication state display (TxD and RxD)
2 2 LEDs for termination state display
3 Allocation of signal name
4 5-pin terminal block for communication interface

114.4.1 Serial interface

Serial interface RS-485(I)

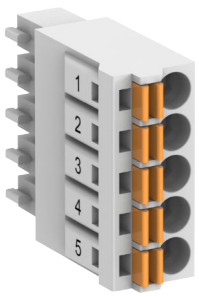
NOTICE!

Damage to the serial communication interface by using 5-pin terminal block of the TA5101-4DI!

If the 5-pin terminal block of the TA5101-4DI option board is plugged into a option board for COMx serial communication TA5141-RS232I, TA5142-RS485I or TA5142-RS485, the communication interface will be damaged by the 24 V.

Please do not confuse the 5-pin terminal block of the TA5101-4DI with the 5-pin terminal block for serial communication interface of TA5141-RS232I, TA5142-RS485I or TA5142-RS485.

Table 104: TA5142-RS485(I)

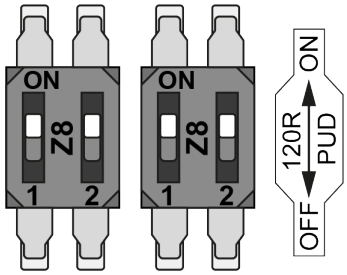
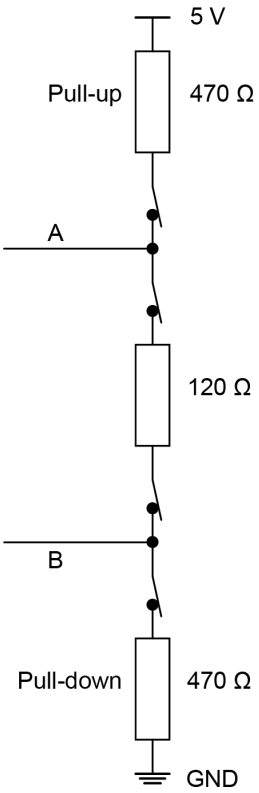
Serial interface	Pin	Signal
	1	A1 internally connected to A2
	2	B1 internally connected to B2
	3	GND
	4	A2 internally connected to A1
	5	B2 internally connected to B1

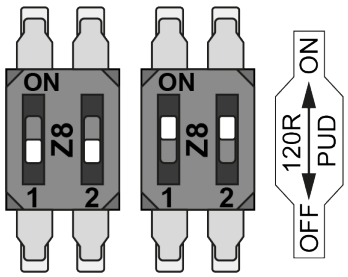
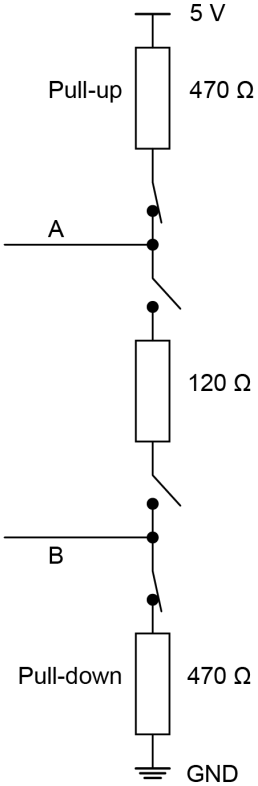
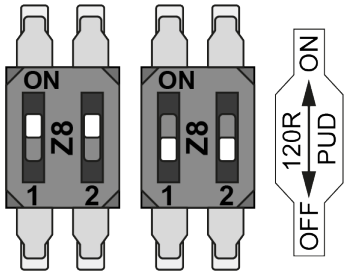
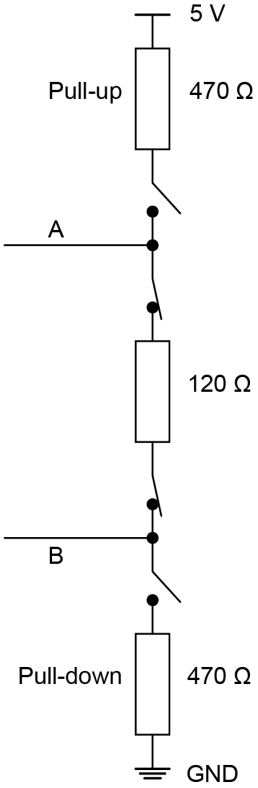
114.4.2 Bus termination configuration

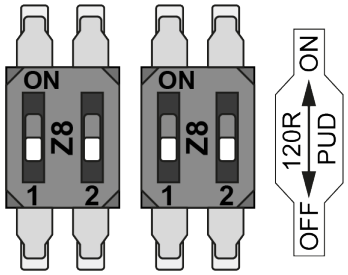
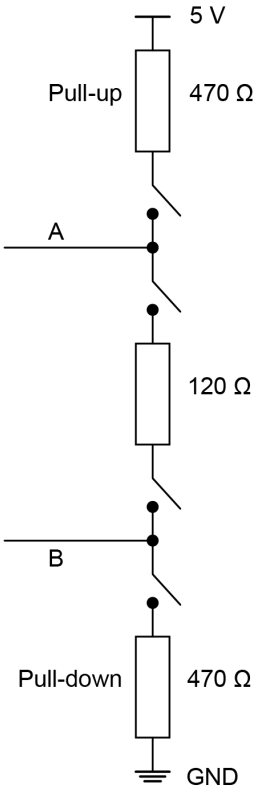
Bus termination configuration
The bus termination configuration is only available for TA5142-RS485I and TA5142-RS485.

Avoid changing the position of the switch in the temperature range from -20°C to -40°C to prevent the switch from malfunctioning.

Table 105: Configuration

Settings on the module	State of LEDs	Internal wiring diagram	Description
			Master at the bus line end, pull-up and pull-down activated, bus termination 120 Ω

Settings on the module	State of LEDs	Internal wiring diagram	Description
			Master within the bus line, pull-up and pull-down activated
			Slave at the bus line end, bus termination 120 Ω

Settings on the module	State of LEDs	Internal wiring diagram	Description
			Slave within the bus line

114.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

115 TA5146-CN(W) - Option board for CAN communication

- TA5146-CN
- TA5146-CNW for wide temperature range



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

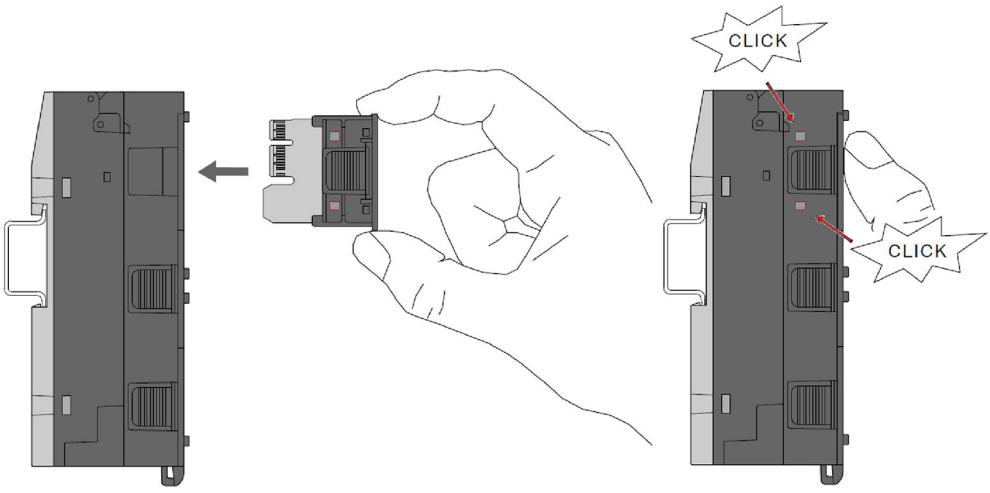
CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

- ESD (electrostatic discharge) protection measures are required when handling the option board.
- Do not touch contacts and circuit board.

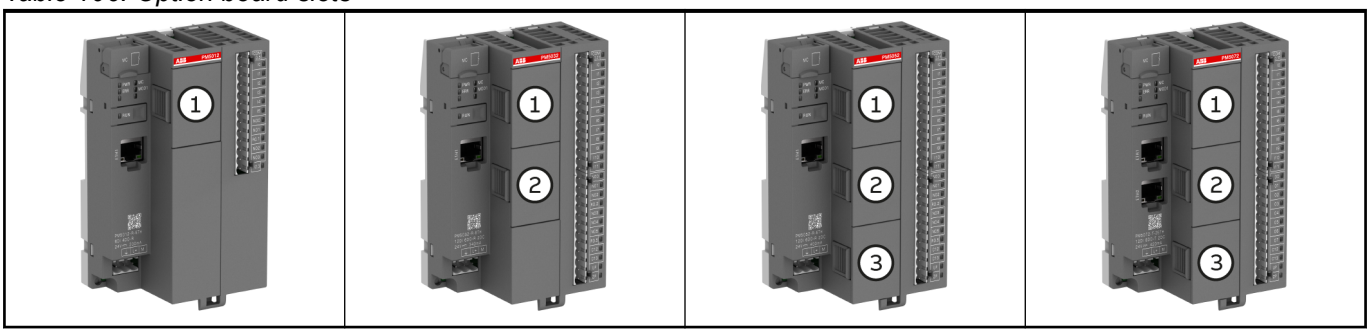
115.1 Assembly



115.1.1 Optimized mounting of the option boards

The AC500-eCo processor modules have up to 3 slots for option boards.

Table 106: Option board slots



The best thermal circulation is given on slot 3 (bottom slot), followed by slot 2 (middle slot) and then slot 1 (top slot).

The best mounting position of the option board depends on its power dissipation.

Rules for optimized mounting of the option boards

- *The higher the power dissipation of the option board, the lower the mounting position should be selected.*
- ***The TA5126-2AO-UI option board has the highest power dissipation and must always be mounted at the lowest possible option board slot.***

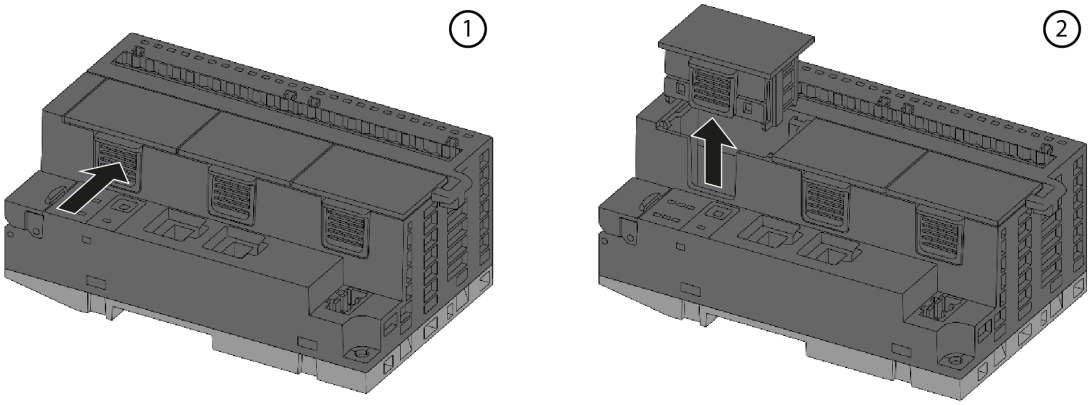
The optimized mounting position can be easily determined with the help of this table.

Table 107: Power dissipation of the option boards

Power dissipation of the option boards	Digital	Analog	Serial interface	Accessory
very small			TA5141-RS232I(W) TA5142-RS485I(W) TA5142-RS485(W)	TA5130-KNXPB(W) TA5131-RTC
small	TA5105-4DOT(W)	TA5122-2AI-TC(W) TA5123-2AI-RT(W)		
medium	TA5110-2DI2DO(T/W) TA5101-4DI(W)	TA5120-2AI-UI(W)		
large		TA5126-2AO-UI(W)		

If the option boards to be mounted are in the same power dissipation level, then the slots can be freely selected.

115.2 Disassembly



CAUTION!

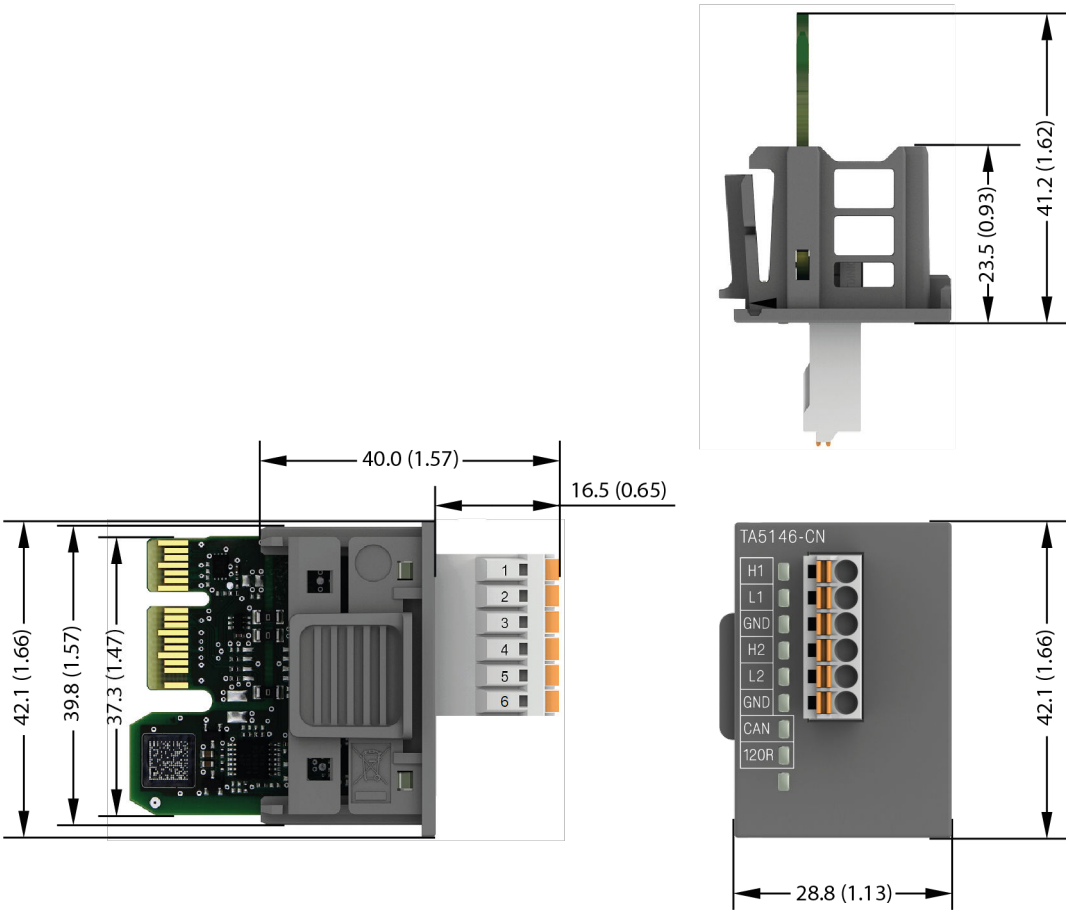
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

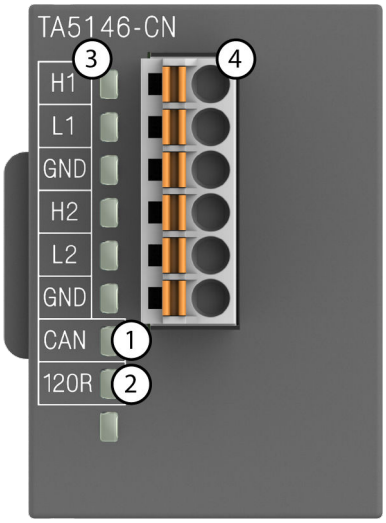
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

115.3 Dimensions



The dimensions are in mm and in brackets in inch.

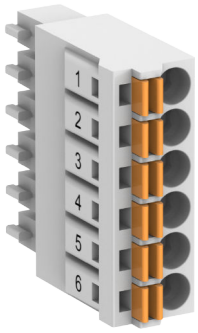
115.4 Connections



1 1 yellow LED to display CAN activity
2 1 yellow LED to display the activation of 120 Ω termination resistor
3 Allocation of signal name
4 6-pin terminal block for CAN communication

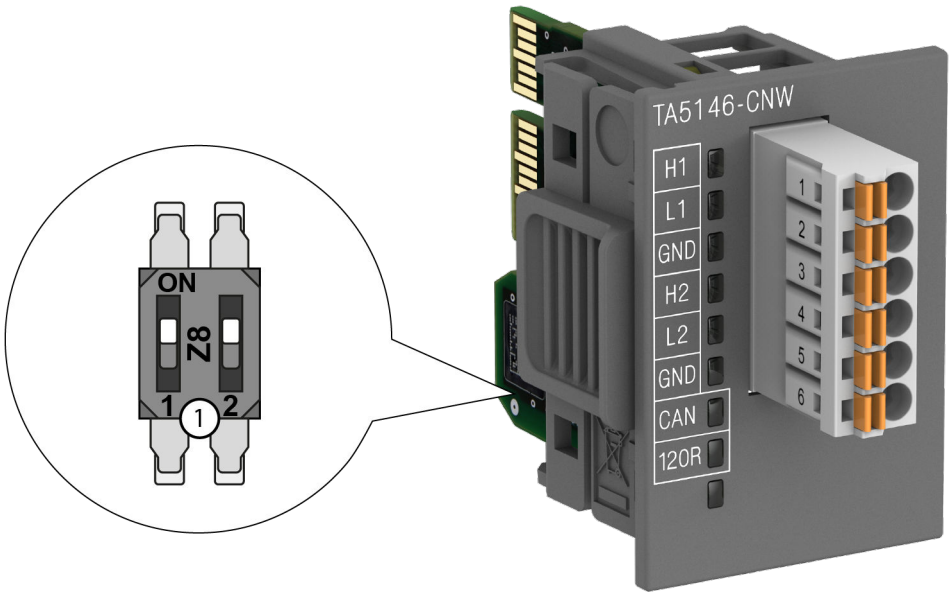
115.4.1 CAN interface

Table 108: TA5146-CN

Terminal block for CAN	Terminal	Signal	Description
	1	H1 internally connected to H2	Bus line, receive/transmit line, HIGH
	2	L1 internally connected to L2	Bus line, receive/transmit line, LOW
	3	GND	CAN reference potential
	4	H2 internally connected to H1	Bus line, receive/transmit line, HIGH
	5	L2 internally connected to L1	Bus line, receive/transmit line, LOW
	6	GND	CAN reference potential

115.4.2 Bus termination configuration

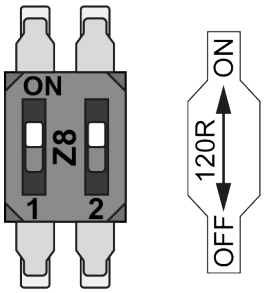
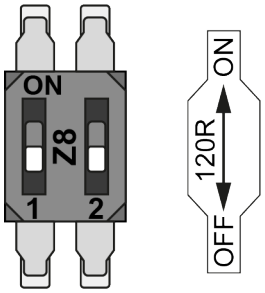
Bus termination The ends of the data lines have to be terminated with a 120 Ω bus terminating resistor. The bus terminating resistor is usually installed directly at the bus connector.



1 Termination resistance settings

Position 1 of the DIP switch activates/deactivates the 120 Ω termination resistor. The position 2 turns ON/OFF the 120R LED

Table 109: Configuration

Settings on the module	State of LEDs	Description
		Bus termination 120 Ω is activated (Position 1 is ON). Termination LED - 120R is turned ON (Position 2)
		Bus termination 120 Ω is deactivated (Position 1 is OFF). Termination LED - 120R is turned OFF (Position 2)

115.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA51xx option boards	8 - 10 mm	X	-	0.4 x 2.5 mm	0.2 - 1.5 mm^2

116 TA515-CASE / TA5450-CASE

- TA515-CASE
- TA5450-CASE



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

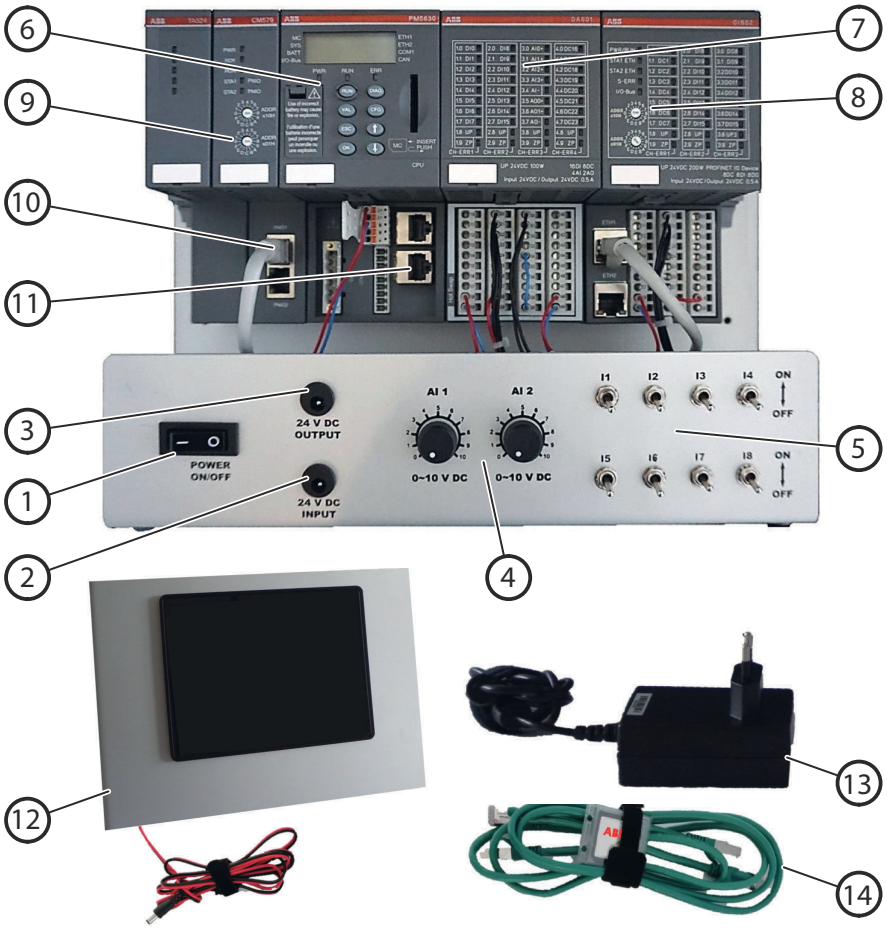
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

WARNING!

Risk of injury and damaging the product!

– Only use the training case with the delivered power supply adapter
– Only use the training case for demonstration and training activities
– The operating temperature for training case is 0 °C … + 40°C
– This training case is a class A device for EMC, because the main components (e.g. PLC) inside are designed for industrial applications. It can cause radio-interference in residential areas.

116.1 Connections



1 24 V DC power switch
2 24 V DC power input socket
3 24 V DC power output socket
4 2 Potentiometers
5 8 switches
6 TA515-CASE: CPU PM585-ETH / TA5450-CASE: CPU PM5630-2ETH
7 Analog/digital I/O module DA501
8 Communication interface module CI502-PNIO
9 Communication module CM579-PNIO
10 PROFINET connection
11 TA515-CASE: TB521-ETH Ethernet Plug ETH1 for Panel connection / TA5450-CASE: TB5620-2ETH Ethernet Plug ETH2 for Panel connection
12 Panel with power supply cable
13 Power adapter, AC DC Power supply 24 Volt, 40 Watt, Type GE40I24-P1J
14 Ethernet cables and memory card containing demo program

116.1.1 System setup

Remove the system from the case and place it upright.

For initial start-up, remove the power supply unit (13) and the supplied socket adapters. Select the appropriate socket adapter and lock it firmly onto the power supply unit. Make sure that the mains voltage is within the input range of the power supply unit.

Connect the power supply unit to the mains socket and the cable plug to the power input socket (2). Connect the power supply cable of the control panel (12) to the output socket (3). Connect an Ethernet cable (14) on one side to the ETH0 Ethernet socket of the control panel (12) and on the other side to the Ethernet socket (11) of the terminal base. After switching on the power switch (1), the system starts loading the demo programs of PLC and control panel and is then ready to use the demo program.

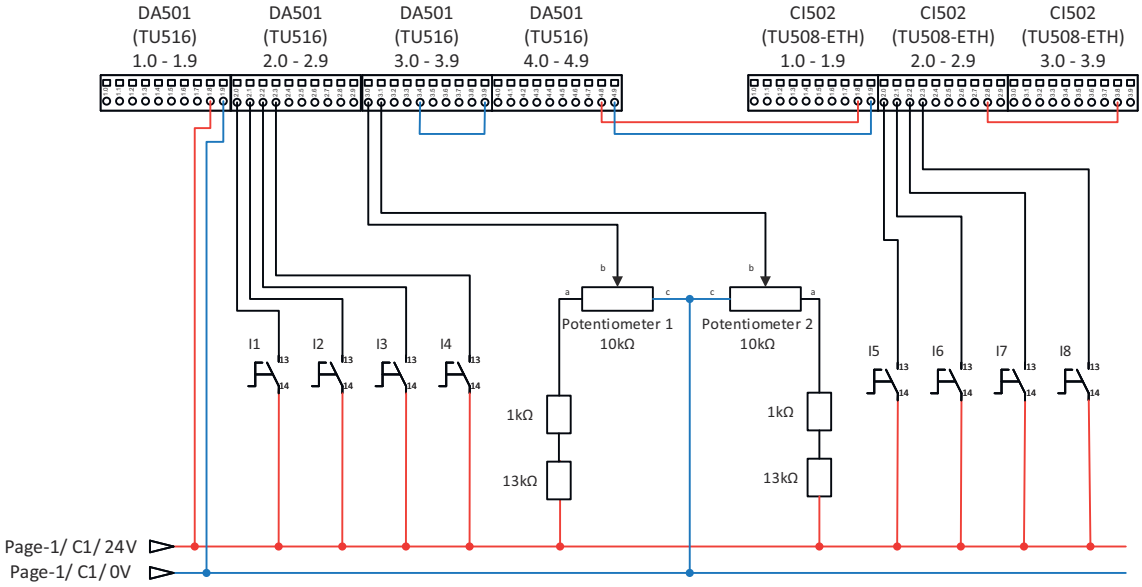
116.1.2 Features of demo program

The demo is ready for use when the CPU display is showing „run“ and the panel screen shows „CP600-Pro Demo Project“. Touching „Training Case“ opens the visualization of the input states of the I/O channels. The input status on the screen changes when potentiometer (4) or switches (5) are operated. The demo program in the PLC reads inputs and copies the input state to outputs. On the I/O modules can be observed that the status LED of outputs are following the input status. Touching the house symbol (upper right corner) closes the demo visualization. The other buttons on the panel screen open demos for features of the panel.

116.1.3 Restoring demo program

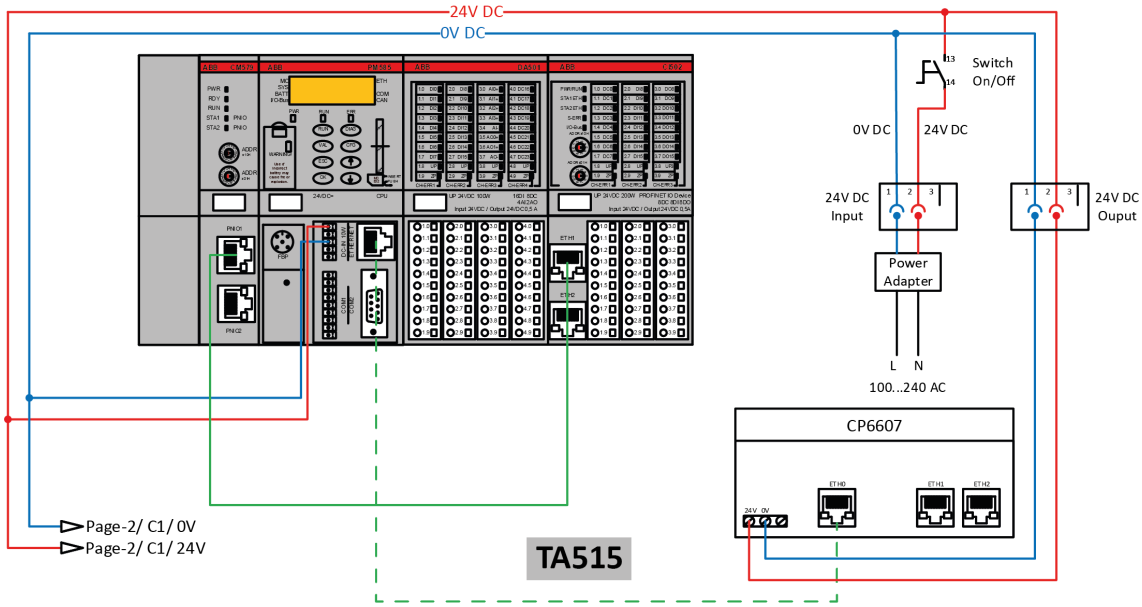
The training case is delivered with demo program installed. If needed, the demo program can be restored from the memory card. The QR code opens the operation instruction explaining configuration of components and procedure for loading the demo program into PLC and panel.

116.1.4 Power supply

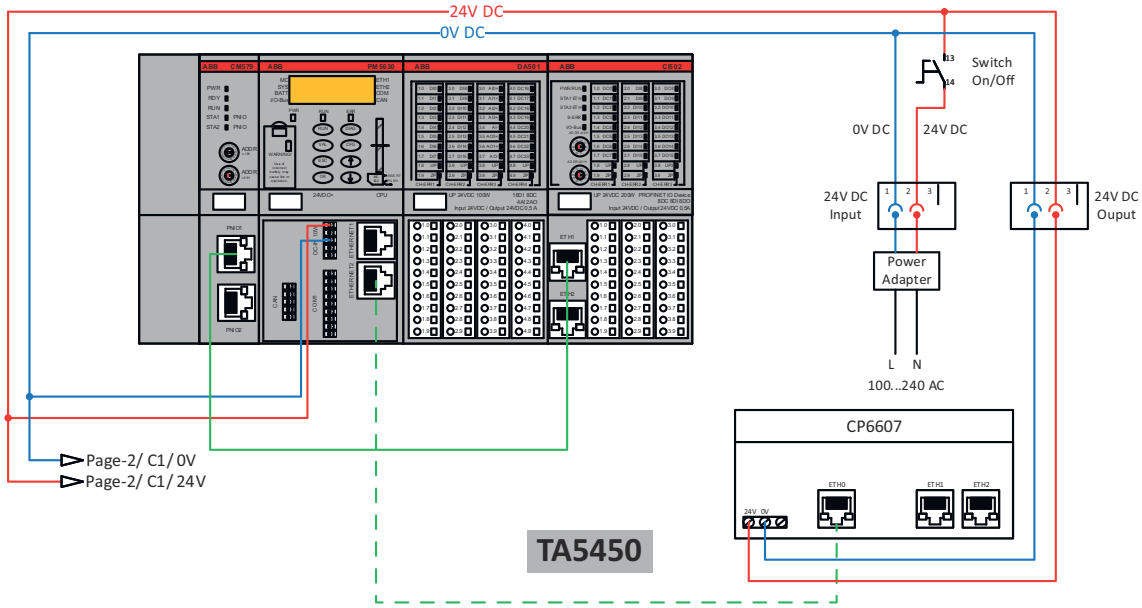


116.1.5 Inputs/Outputs

TA515



TA5450



117 TA521 - Adapter cable with button cell

- Adapter cable with encapsulated primary button cell
- Contains a manganese dioxide lithium primary button cell, 3 V, 560 mAh
- Non-rechargeable



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

CAUTION!

This adapter cable with button cell is the only one which can be used with AC500 CPUs.

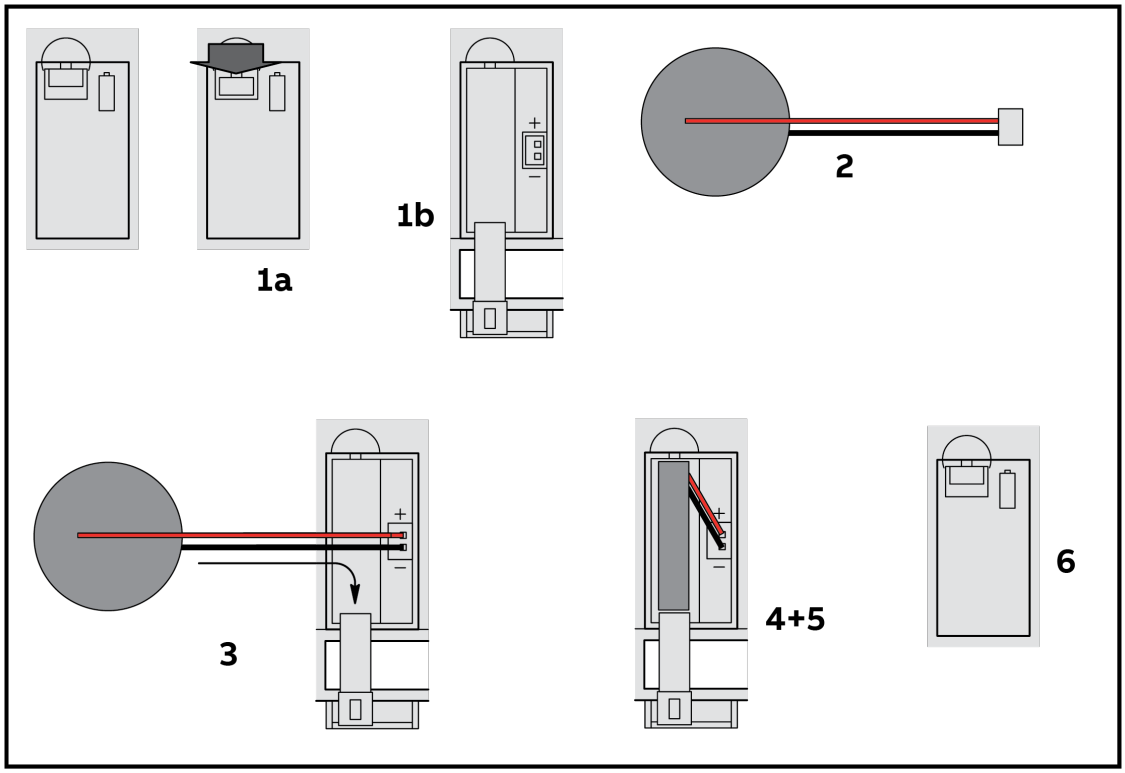
- Replace TA521 only with activated supply voltage.
- In order to prevent data loss or problems, the TA521 should be replaced after 3 years of utilisation or at least as soon as possible after receiving the "low primary lithium battery warning" indication.
- Do not use the TA521 older than 3 years for replacement, do not keep device too long in stock.
- TA521 must not be re-charged, not be disassembled and not be disposed of in fire. Attempting to charge primary lithium button cell will lead to over-heating and can cause explosions.
- TA521 must be stored in a dry place.
- Exhausted TA521 must be recycled to respect the environment.
- Never short-circuit or operate primary lithium button cell with the polarities reversed. The primary lithium button cell are likely to overheat and explode. Avoid unintentional short circuiting do not store primary lithium button cell in metal containers and do not place them on metallic surfaces. Escaping lithium is a health hazard.

117.1 Assembly

Insertion

To ensure proper operation and to prevent data loss, the insertion or replacement of the TA521 must be always done with the system under power. Data buffering is not possible without the TA521 and power supply at the same time.

WARNING!
Risk of fire or explosion!
Use of incorrect equipment may cause fire or explosion.



1. Open the compartment with the small locking mechanism, press it down and slip down the door. The door is attached to the front panel of the processor module and cannot be removed.
2. Remove the TA521 adapter cable with button cell from its package and hold it by the small cable. If the old TA521 needs to be replaced, remove then the small connector from the socket, do this best by lifting it out with a screwdriver.
3. Insert the TA521 connector of the adapter into the small connector port of the compartment. The connector is keyed to find the correct polarity (red = positive pole = above).
4. Insert first the cable and then the button cell into the compartment, push it until it reaches the bottom of the compartment.
5. Arrange the cable in order not to inhibit the door to close.
6. Pull-up the door and press until the locking mechanism snaps.

Replacement of the adapter cable with button cell

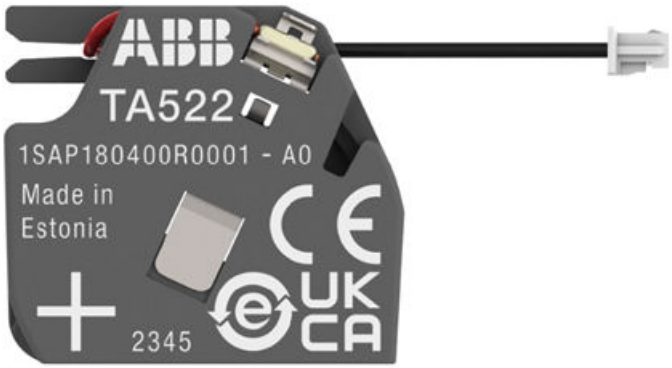
1. Make sure that the system is powered.
2. Open the compartment with the small locking mechanism, press it down and slip down the door. The door is attached to the front panel of the processor module and cannot be removed.
3. Remove the old TA521 adapter cable with button cell from the compartment by pulling it by the small cable. Remove then the small connector from the socket, do this best by lifting it out with a screwdriver.



4. Follow the previous instructions to insert a new TA521.

118 TA522 - Adapter for CR2450 battery

- The TA522 is an adapter for CR2450 battery.



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

CAUTION!

Lithium battery CR2450 is the only primary lithium battery to be used with AC500 devices.

- Do not use TA522 adapter with unapproved primary lithium battery. It can cause product damage and data loss.
- Replace primary lithium battery only with activated supply voltage.
- Exhausted primary lithium battery must be recycled to respect the environment.

CAUTION!

The TA522 adapter cannot be used with AC500-XC. For more information regarding AC500-XC refer to TA521 documentation.



CAUTION!

Risk of explosion!

Do not open, re-charge or disassemble primary lithium battery. Attempting to charge primary lithium battery will lead to overheating and can cause explosions.

Protect them from heat and fire and store them in a dry place.

Never short-circuit or operate primary lithium battery with the polarities reversed. The primary lithium battery are likely to overheat and explode. Avoid unintentional short circuiting do not store primary lithium batteries in metal containers and do not place them on metallic surfaces. Escaping lithium is a health hazard.



In order to prevent data loss or problems, the primary lithium battery should be replaced after 3 years of utilisation or at least as soon as possible after receiving the "low primary lithium battery warning" indication.

Do not use a primary lithium battery older than 3 years for replacement, do not keep primary lithium battery too long in stock.

To display the primary lithium battery load capacity, use the PLC Shell command “Batt”.

118.1 Assembly

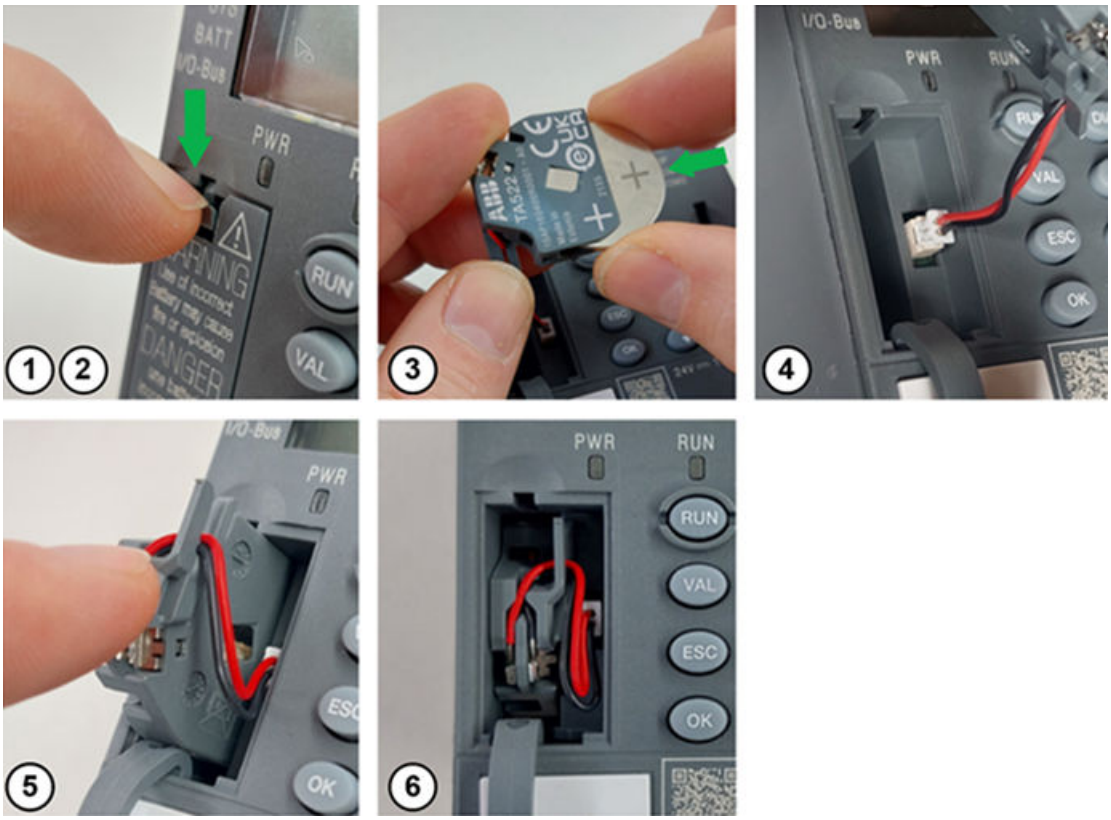
Insertion



WARNING!

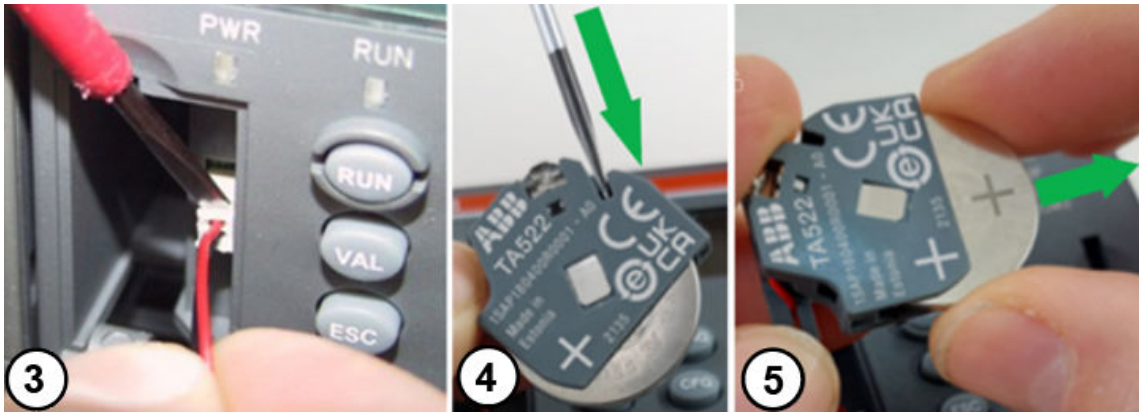
Risk of fire or explosion!

Use of incorrect primary lithium battery may cause fire or explosion.



1. Open the primary lithium battery compartment with the small locking mechanism (press direction as arrow shows), press it down and slip down the door. The door is attached to the front panel of the processor module and cannot be removed.
2. Remove the TA522 adapter from its package and insert the primary lithium battery (type CR2450) into the TA522 adapter.
3. Observe the correct polarity according to the markings on the TA522 adapter and the primary lithium battery itself.
4. Insert the primary lithium battery connector into the small connector port of the compartment. The connector is keyed to find the correct polarity (red = positive pole = above).
5. Insert the TA522 adapter for CR2450 battery into the compartment and push it until it reaches the bottom of the compartment.
6. Arrange the cable in a way that allows the cover to close.
7. Pull-up the door and press until the locking mechanism snaps.

Replacement of the primary lithium battery



1. Make sure that the system is powered.
2. Open the primary lithium battery compartment with the small locking mechanism, press it down and slip down the door. The door is attached to the front panel of the processor module and cannot be removed.
3. Remove the old TA521 primary lithium battery or the TA522 adapter from the primary lithium battery compartment. Remove then the small connector from the socket with a screwdriver. Try to avoid pulling it by the cable.
4. Push the old primary lithium battery out of the TA522 adapter for CR2450 battery using a screwdriver.
5. Replace the primary lithium battery type CR2450.
6. Follow the previous instructions to insert a new primary lithium battery *“Insertion” on page 771*.

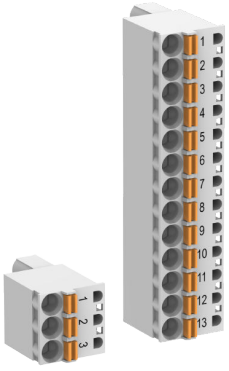
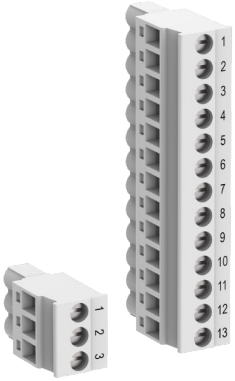
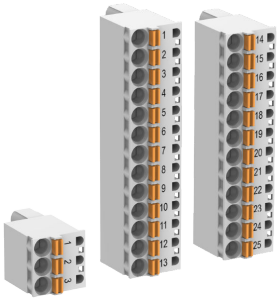
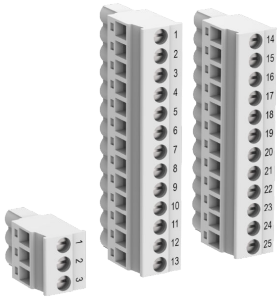
119 TA52xx(-x) - Terminal block sets

- TA5211-TSPF-B
- TA5211-TSCL-B
- TA5212-TSPF
- TA5212-TSCL
- TA5220-SPF5
- TA5220-SPF6
- TA5220-SPF7
- TA5220-SPF8

For the AC500-eCo **Basic CPUs** a 3-pin terminal block for power supply and a 13-pin terminal block for I/O connectors are used.

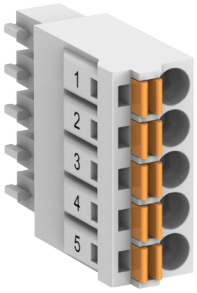
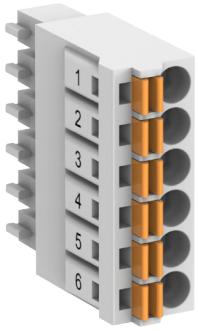
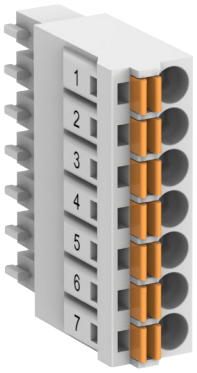
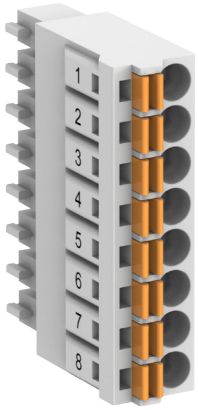
For the AC500-eCo **Standard CPUs** and **Pro CPUs** a 3-pin terminal block for power supply, a 13-pin terminal block and a 12-pin terminal block for I/O connectors are used.

For all CPUs there is a screw and a spring variant available.

Basic CPU		**Standard and Pro CPUs**	
Spring terminal **TA5211-TSPF-B**	**Screw terminal** **TA5211-TSCL-B**	**Spring terminal** **TA5212-TSPF**	**Screw terminal** **TA5212-TSCL**
			

Various removable spring terminal blocks are available for option boards.

The following spare parts are available (depending on the number of pins).

Spring terminals			
TA5220-SPF5	**TA5220-SPF6**	**TA5220-SPF7**	**TA5220-SPF8**
			

CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

Terminal block set for PM50x2

Processor modules PM50x2 CPU are not delivered with terminal blocks.

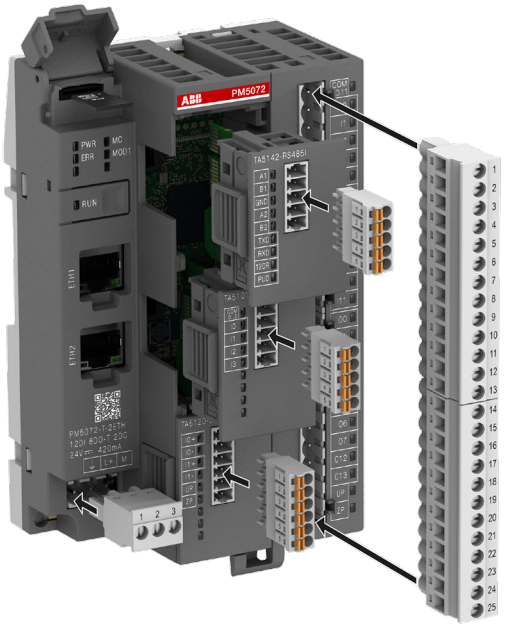
Screw terminal block set:

- *TA5211-TSCL-B (1SAP187400R0001) for PM5012-x-ETH*
- *TA5212-TSCL (1SAP187400R0004) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

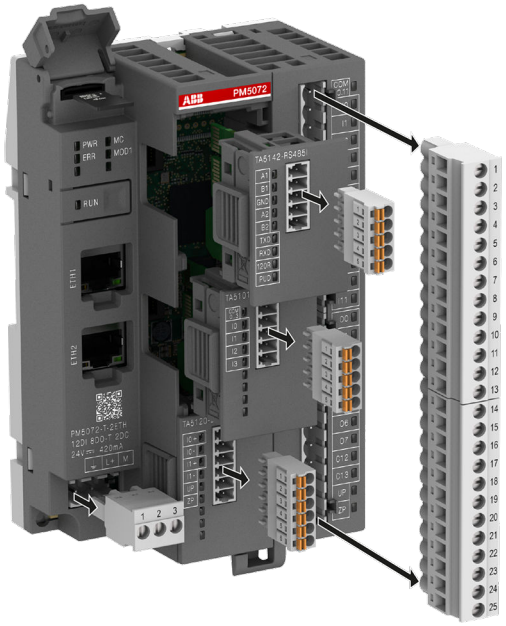
Spring terminal block set:

- *TA5211-TSPF-B (1SAP187400R0002) for PM5012-x-ETH*
- *TA5212-TSPF (1SAP187400R0005) for PM5032-x-ETH, PM5052-x-ETH, PM5072-T-2ETH(W), PM5082-T-2ETH, PM5092-T-2ETH*

119.1 Assembly



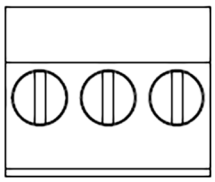
119.2 Disassembly

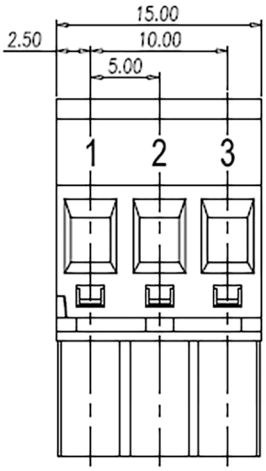


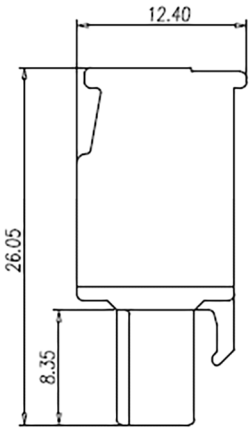
119.3 Dimensions

119.3.1 3-pin terminal block for power supply

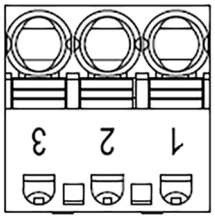
Screw terminal

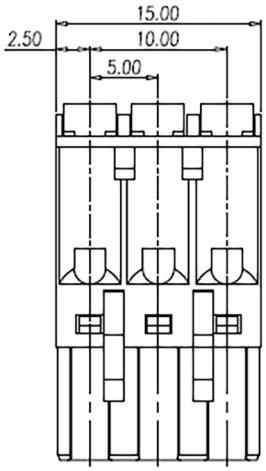


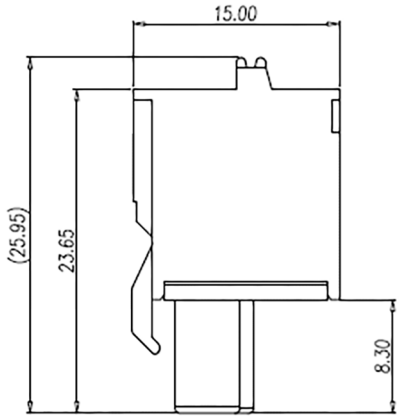




Spring terminal

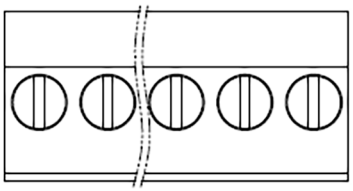


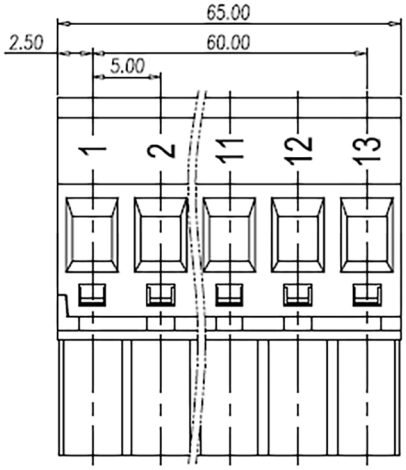


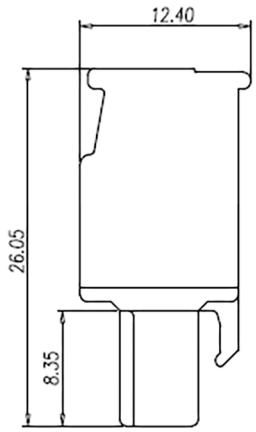


119.3.2 13-pin terminal block for I/O connectors

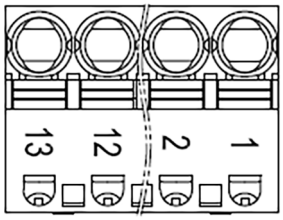
Screw terminal

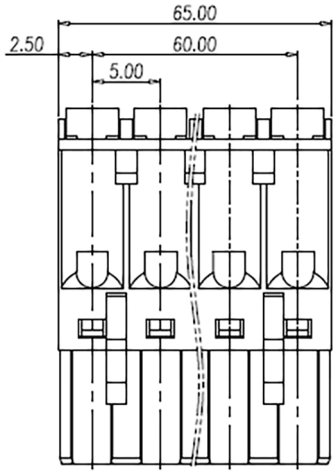


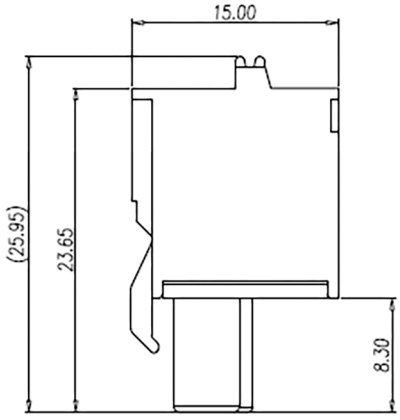




Spring terminal

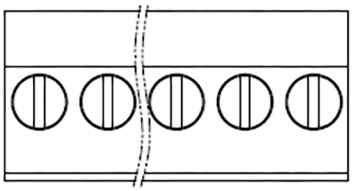


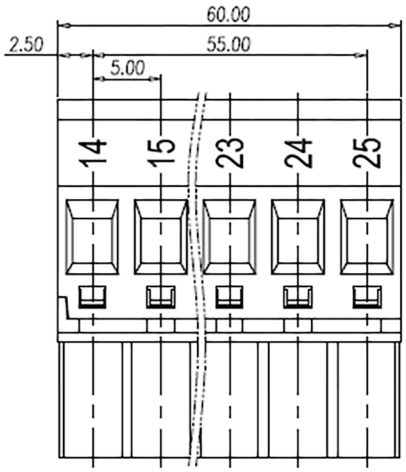


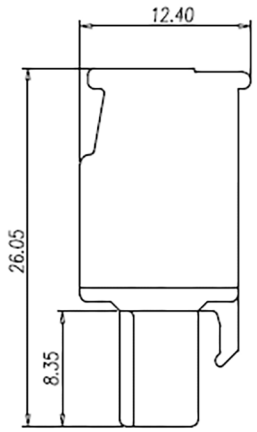


119.3.3 12-pin terminal block for I/O connectors

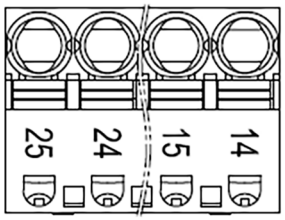
Screw terminal

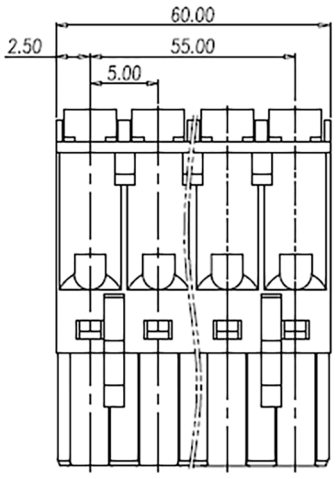


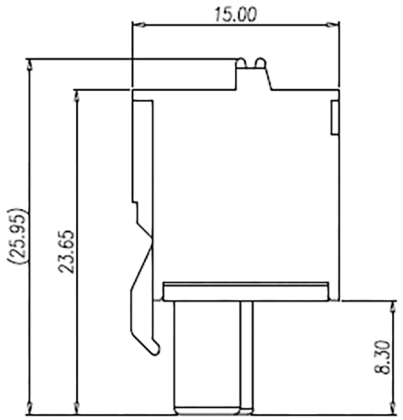




Spring terminal

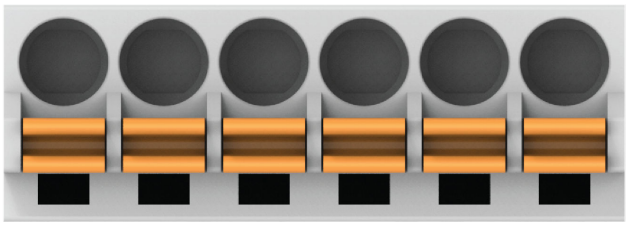


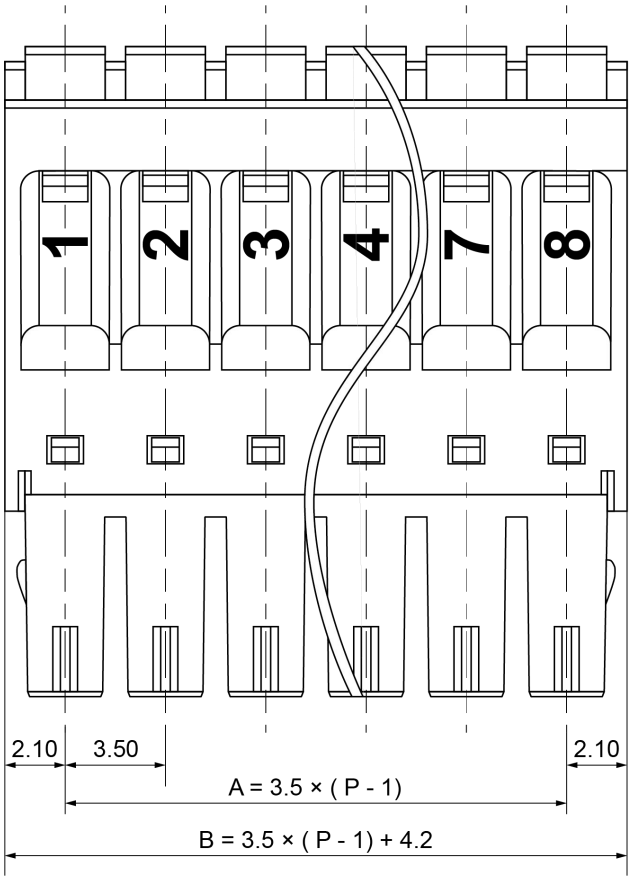


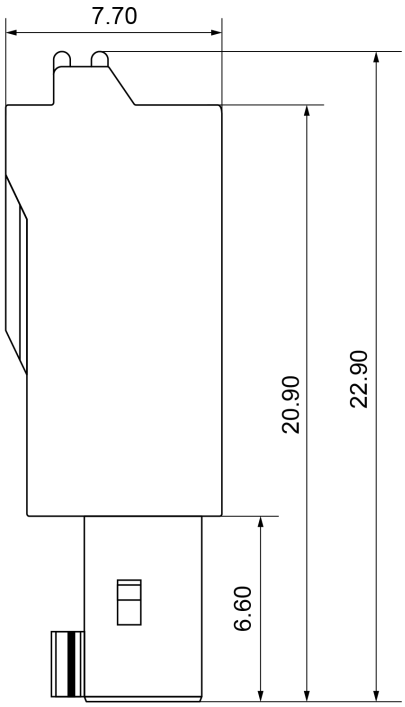


119.3.4 x-pin terminal blocks for option boards

Only these x-pin terminal blocks are available for the option boards.
*TA5220-SPF**x**, with **x** = 5 ... 8*







This results in these dimensions for the available spring terminal blocks.

Description	Pin	Length [mm]	Wide [mm]	Height [mm]
TA5220-SPF5	5	18.2	7.7	22.9
TA5220-SPF6	6	21.7	7.7	22.9
TA5220-SPF7	7	25.2	7.7	22.9
TA5220-SPF8	8	28.7	7.7	22.9

119.4 Connections



The connections are described in the PM50x2 processor module or in the TA51xx option boards.

120 TA5300-CVR - Option board slot cover

- TA5300-CVR



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

CAUTION!

Risk of damaging the product!

Option boards are sensitive electronic devices. Wrong handling can damage the product.

– ESD (electrostatic discharge) protection measures are required when handling the option board.
– Do not touch contacts and circuit board.

CAUTION!

Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

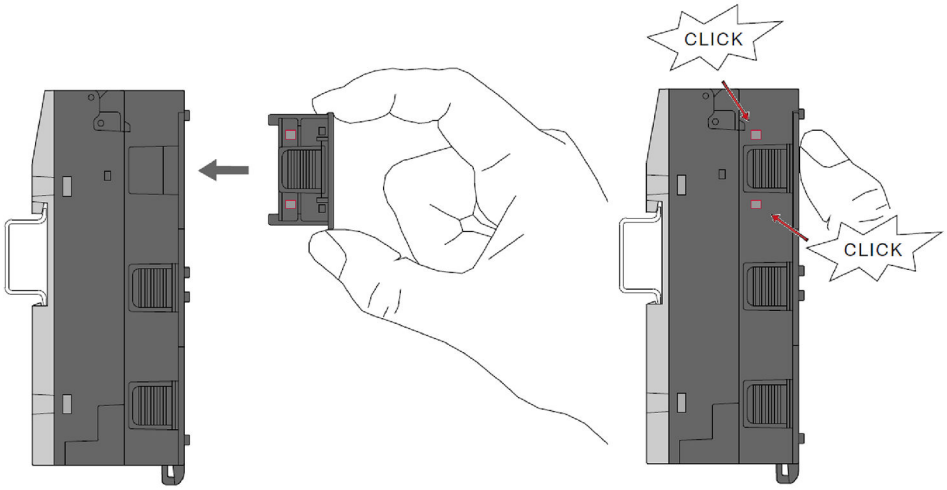
Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

The AC500-eCo processor modules are delivered with option board slot cover(s).

The option board slot cover has to be removed before inserting an option board.

The TA5300-CVR option board slot covers are available as spare parts.

120.1 Assembly



CAUTION!

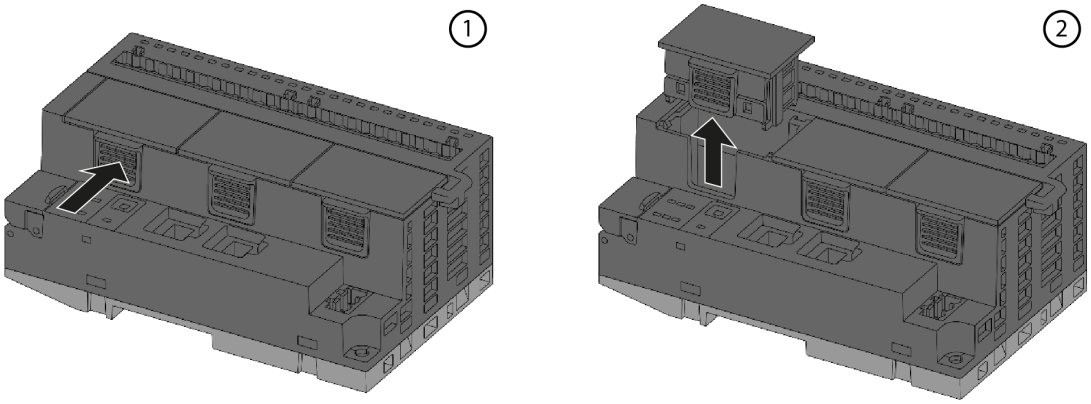
Risk of injury and damaging the product!

Always plug in the option board slot cover when the option board is not inserted.

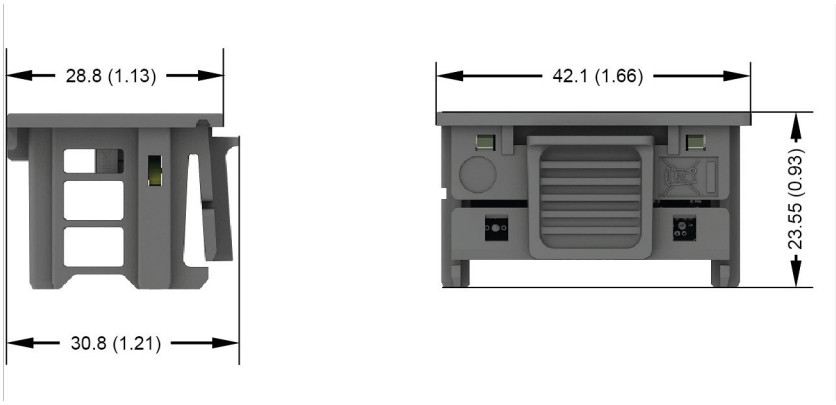
If the option board slot cover is lost, please order the replacement TA5300-CVR (1SAP187500R0001).

Never power up the CPU with uncovered option board slot, otherwise it may cause serious injury and/or damage the product.

120.2 Disassembly



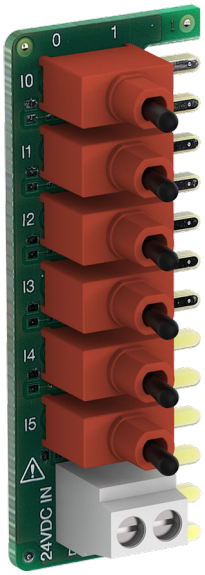
120.3 Dimensions



The dimensions are in mm and in brackets in inch.

121 TA5400-SIM - Input simulator

- TA5400-SIM



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

121.1 Assembly

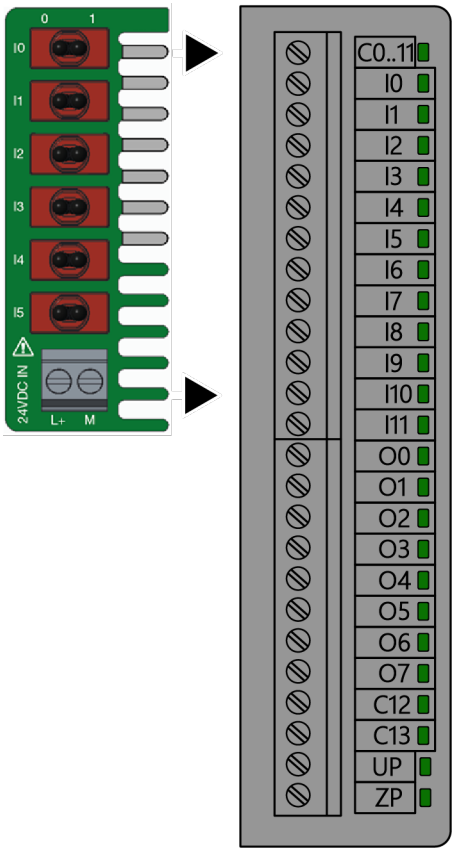
Insertion of the input simulator

1. Make sure that the power supply of the processor module is turned off.

CAUTION!
Risk of damaging the PLC modules!
The PLC modules can be damaged by overvoltages and short circuits.
Make sure that all voltage sources (supply and process voltage) are switched off before working on the system.

CAUTION!
Risk of damaging the input simulator and the PLC modules!
- Never connect voltages > 24 V DC to the terminal block of the input simulator.
- The input simulator may only be used with AC500-eCo processor modules PM50x2.
  Never use the input simulator with other devices.
- The input simulator may only be used with screw-type terminal blocks.
- The input simulator is only intended for testing and training purposes.
  Never use it within productive sytems.

2. Make sure that all clamps of the onboard I/Os are totally open.
3. Insert the TA5400-SIM input simulator into the screw terminal block as shown in the figure.



4. Tighten all screws of the onboard I/O clamps.
5. Make sure all switches are in OFF state (0).
6. Connect 24 V DC to the power supply of the TA5400-SIM (L+ and M). Tighten the screws.

7. Connect the processor module power supply wires (24 V DC) ↳ *"Pin assignment" on page 588*.

121.2 Disassembly

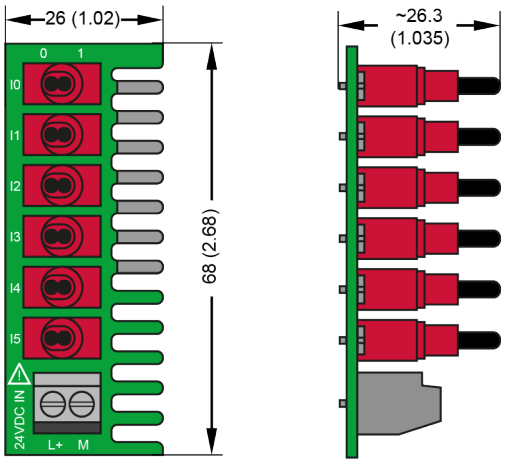
Removal of the input simulator

1. Make sure that the power supply of the processor module is turned off.

> **CAUTION!**
> **Risk of damaging the PLC modules!**
> The PLC modules can be damaged by overvoltages and short circuits.
> Make sure that all voltage sources (supply and process voltage) are switched off before working on the system.

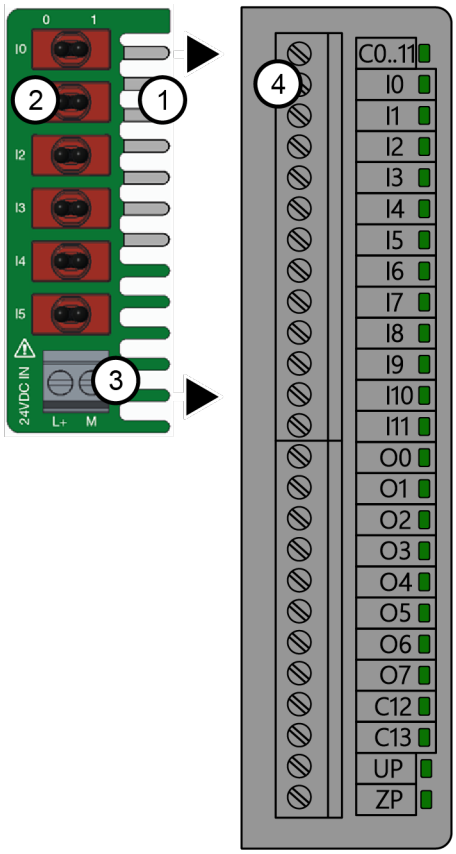
2. Disconnect the TA5400-SIM power supply wires (24 V DC) with a flat-blade screwdriver from the terminal block for power supply (L+ and M).
3. Loosen all screws of the onboard I/Os.
4. Remove the input simulator by pulling it to the left side.

121.3 Dimensions



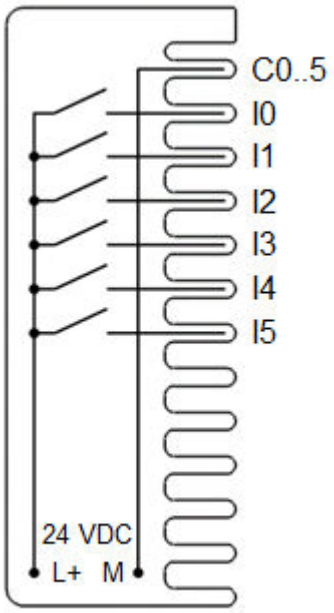
The dimensions are in mm and in brackets in inch.

121.4 Connections



1 Contacts for connecting the input simulator to the terminal block for I/O connectors
2 6 switches for the digital inputs DI0 ... DI5 (0 means opened switch, 1 means closed switch)
3 Screw terminal block for power supply
4 Screw terminal block(s) for I/O connectors

The diagram below shows the connection of the TA5400-SIM input simulator.



NOTICE!

Risk of damage to the TA5400-SIM input simulator!

Do not remove the terminal block while the TA5400-SIM input simulator is connected.

Do not apply mechanical forces to the input simulator when it is connected to the terminal block.

In both cases the input simulator could be damaged.

The TA5400-SIM input simulator can simulate 6 digital 24 V DC input signals to the digital inputs I0...I5 of the onboard I/Os.

With the TA5400-SIMinput simulator, the digital 24 V DC inputs I0...I5 can be turned OFF and ON separately:

- If the lever of the switch is on the right side (1), the input is ON.
- If the lever of the switch is on the left side (0), the input is OFF.

121.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

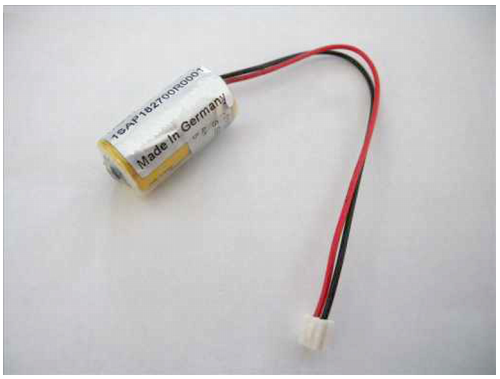
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA5400-SIM	6 - 7 mm	-	0.4 - 0.5 Nm	0.6 x 3.5 mm	0.5 - 2.5 mm^2

122 TA541 - Primary lithium battery

- TA541



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

CAUTION!

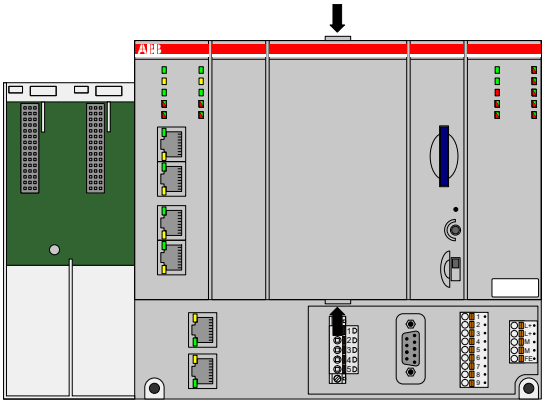
This primary lithium battery is the only one which can be used with AC500 CPUs.

- Replace primary lithium battery only with activated supply voltage.
- Don’t use a primary lithium battery older than 3 years for replacement (e.g. primary cell kept too long in stock).
- Primary lithium battery must not be re-charged, not be disassembled and not be disposed of in fire.
- Primary lithium battery must be stored in a dry place.
- Exhausted primary lithium battery must be recycled to respect the environment.

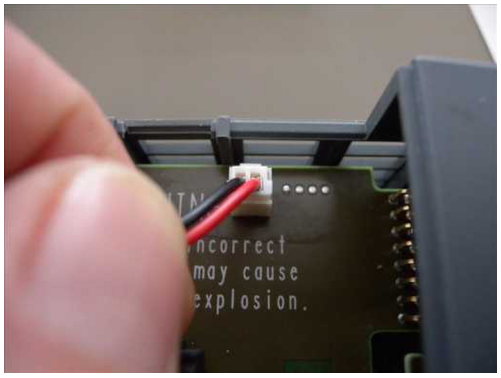
122.1 Assembly

The TA541 is the only applicable primary lithium battery for processor modules PM595.

1. Remove the front panel by pressing the marked areas with your fingers and pull it.



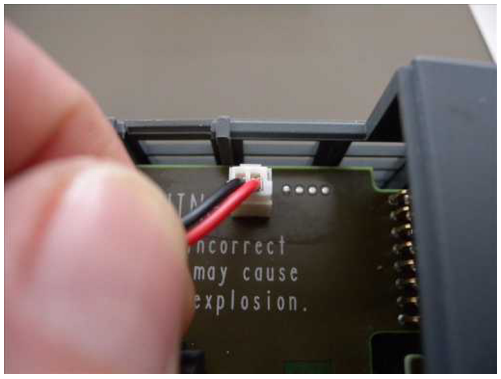
2. Remove the old primary lithium battery from the primary lithium battery compartment by pulling it by the small cable. Remove then the small connector from the socket.



3. Remove the primary lithium battery from its package and hold it by the small cable.



4. Insert the primary lithium battery connector into the connector port of the PCB. The connector is keyed to find the correct polarity (red = positive pole = right side).



5. Insert the primary lithium battery into the compartment on the left side as shown in the figure.



6. Pull-up the door and press until the locking mechanism snaps.

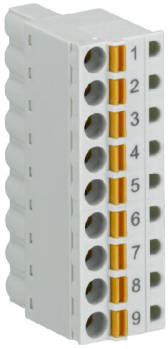
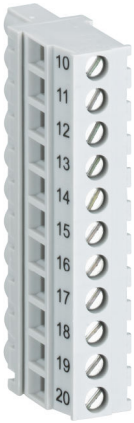
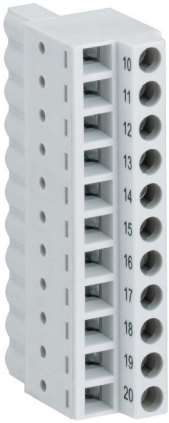
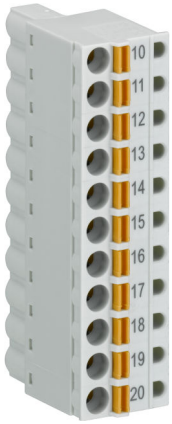
In order to prevent data losses or problems, the primary lithium battery should be replaced after 3 years of utilisation or at least as soon as possible after receiving the "low primary lithium battery warning" indication.

Do not use a primary lithium battery older than 3 years for replacement, do not keep primary lithium battery too long in stock.

123 TA563-TA565 - Terminal block sets

- TA563-9
- TA563-11
- TA564-9
- TA564-11
- TA565-9
- TA564-11

The TA563-TA565 terminal blocks are used to connect process signals and process voltages to AC500-eCo I/O modules and AC500-eCo processor modules (with -P extension inside their type designator only).

Screw terminals with cable insertion on the side	Screw terminals with cable insertion on the front	Spring terminals with cable insertion on the front
TA563-9	TA564-9	TA565-9
		
TA563-11	TA564-11	TA565-11
		

WARNING!

For screw terminals only: Danger of death by electric shock!

The IP 20 protection degree is only provided if all terminal screws are tightened.

Tighten all screws of unused load terminals of relay outputs if voltages > 24 V are connected to the relay group.

CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

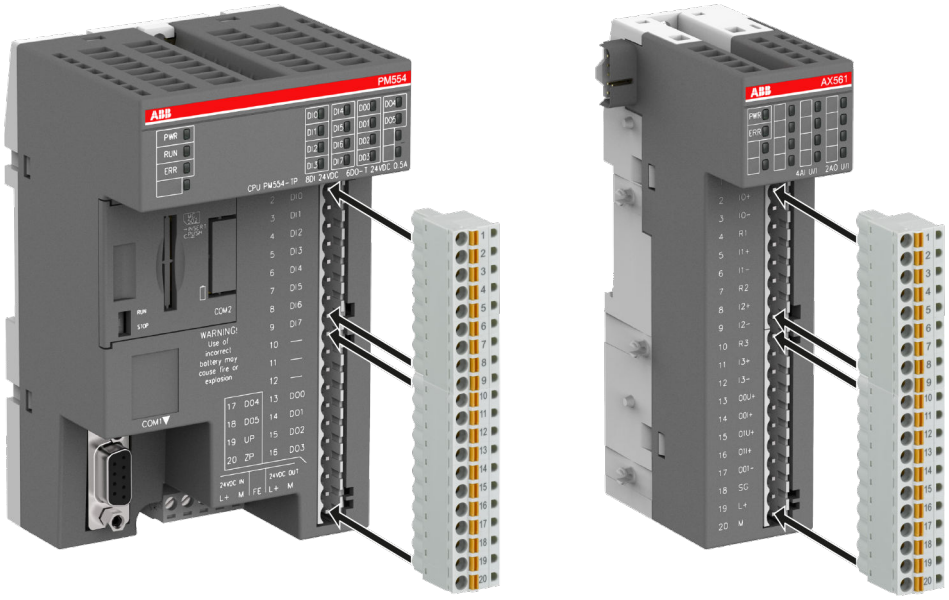
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Read product documentation carefully before wiring. Improper wiring or wrong terminal block from other devices can damage the product!
- Only by qualified personnel.

CAUTION!

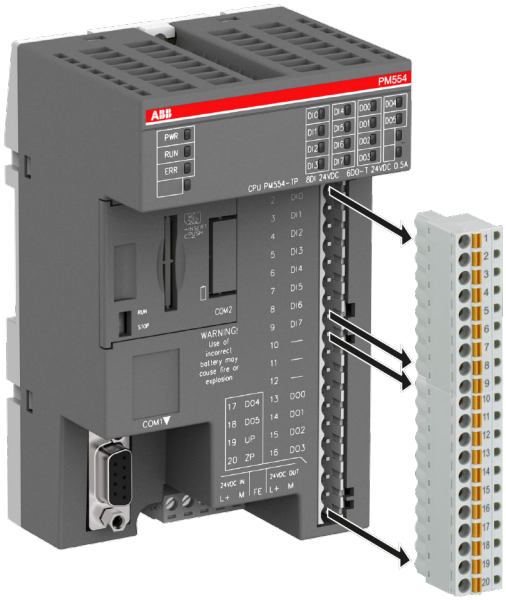
Risk of injury and damaging the module when using unapproved terminal blocks!

Only use terminal blocks approved by ABB to avoid injury and damage to the module.

123.1 Assembly

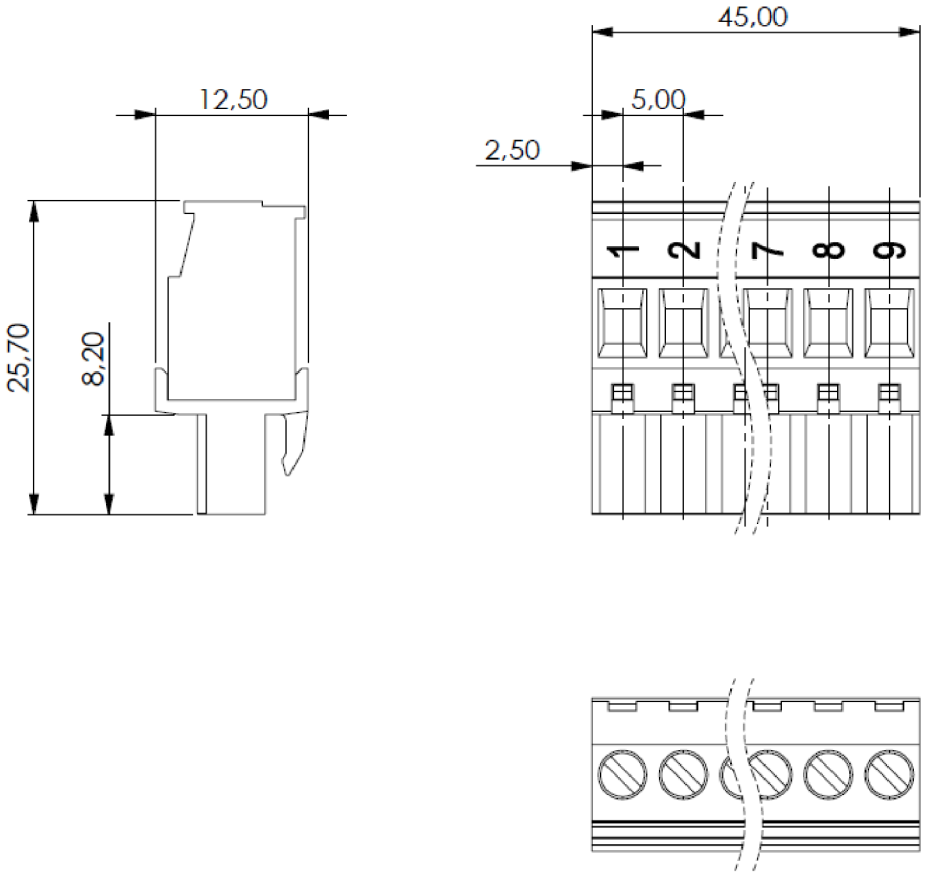


123.2 Disassembly

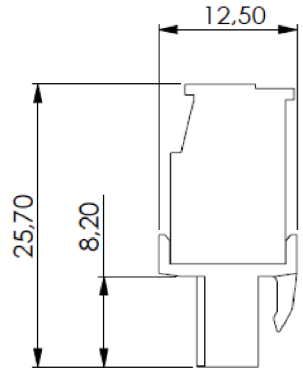


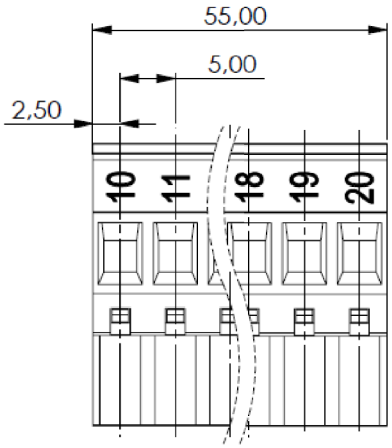
123.3 Dimensions

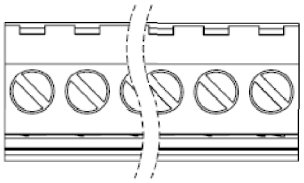
TA563-9



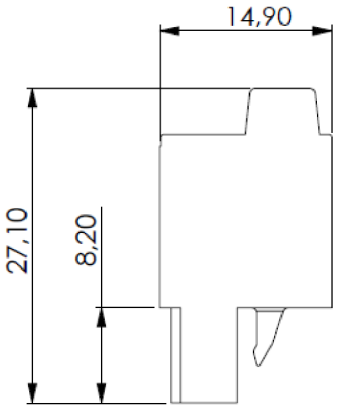
TA563-11

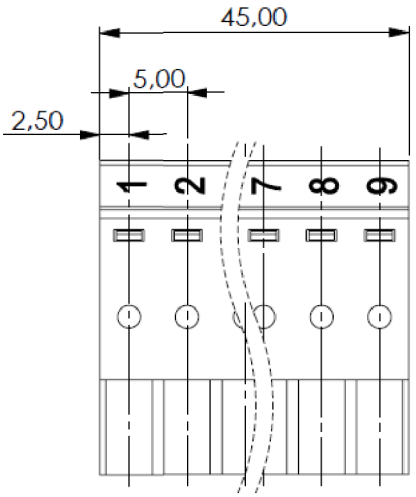


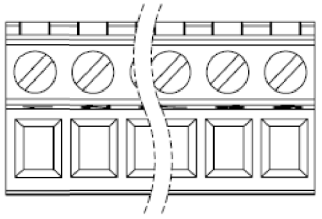




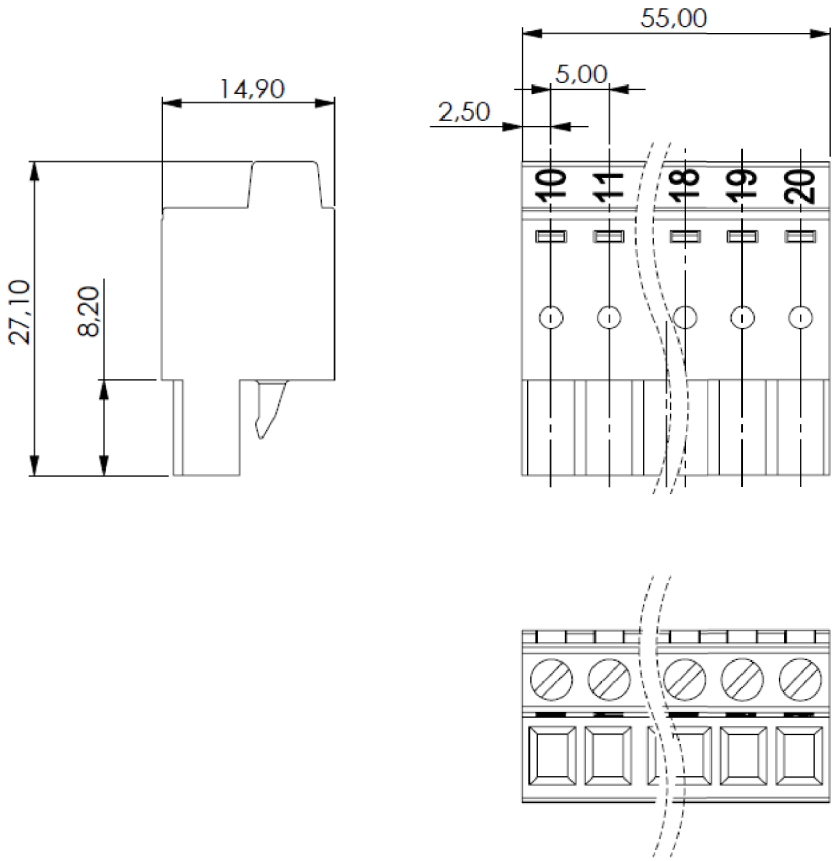
TA564-9



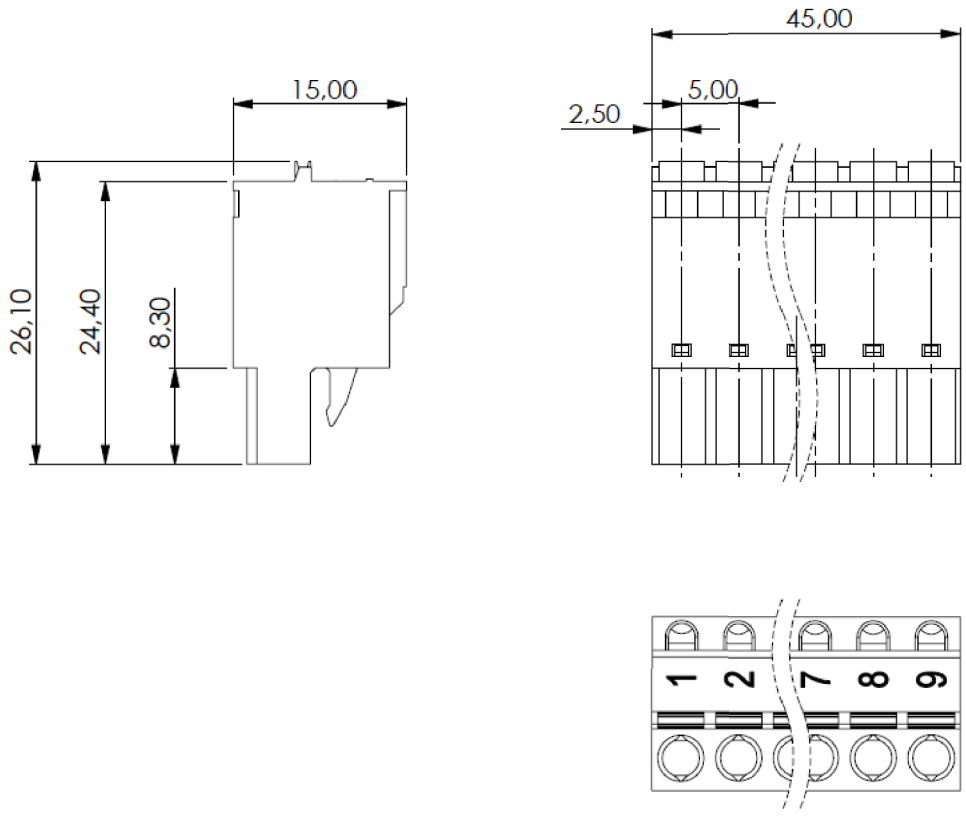




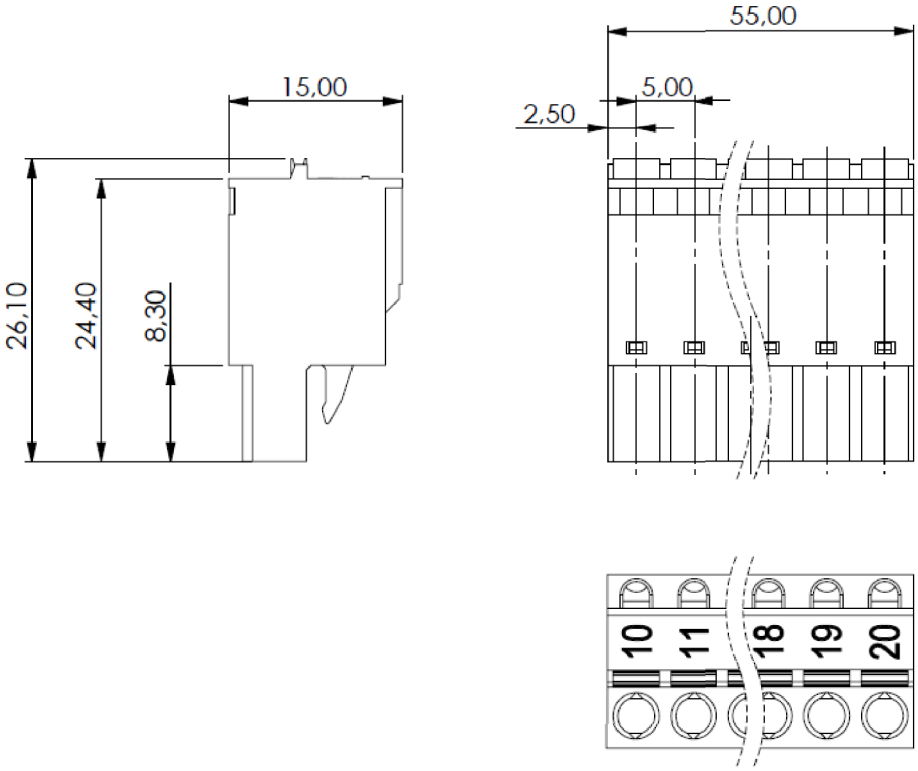
TA564-11



TA565-9



TA565-11



123.4 Connections

The connections are described in the AC500-eCo processor modules or in the AC500-eCo I/O modules.

123.5 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

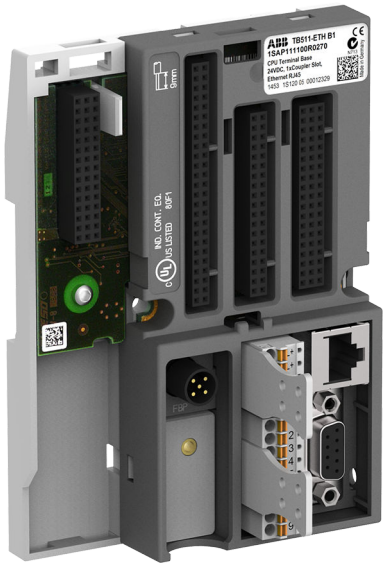
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TA563-x	8 mm	-	0.8 Nm	0.5 x 3 mm	0.5 - 2.5 mm^2
TA564-x	10 mm	-	0.5 Nm	0.5 x 3 mm	0.5 - 2.5 mm^2
TA565-x	10 mm	X	-	0.5 x 3 mm	0.5 - 2.5 mm^2

124 TB511-x(-XC)

- TB511-ARCNET
- TB511-ETH
- TB511-ETH-XC



CAUTION!

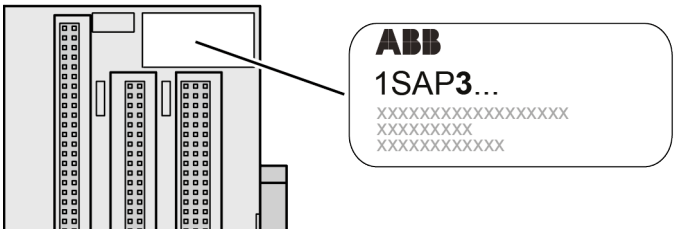
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

XC version

XC = e**X**treme **C**onditions

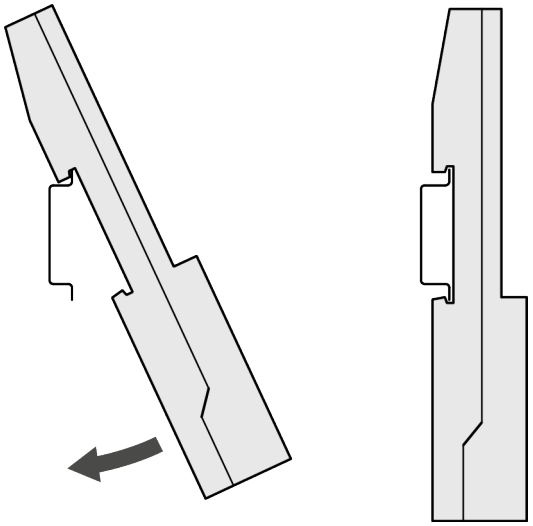


Extreme conditions

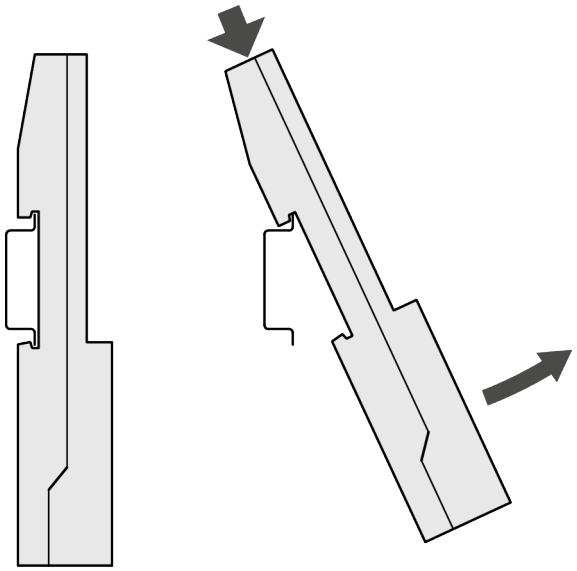
Terminal bases for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **3** in the Part no. 1SAP**3**... (label) identifies the XC version.*

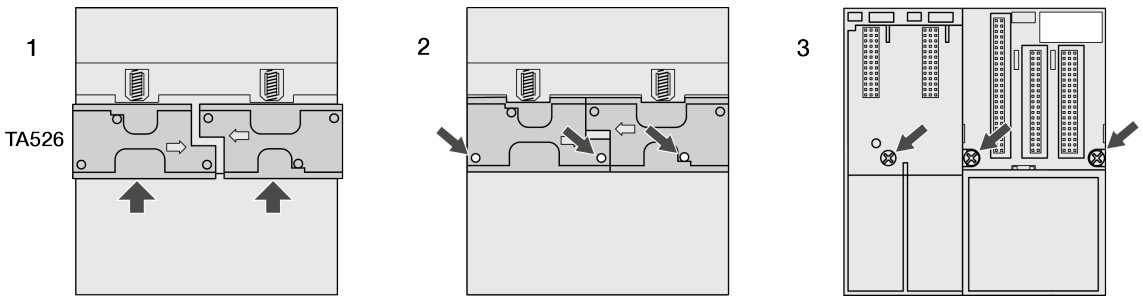
124.1 Assembly



124.2 Disassembly



124.3 Assembly with screws



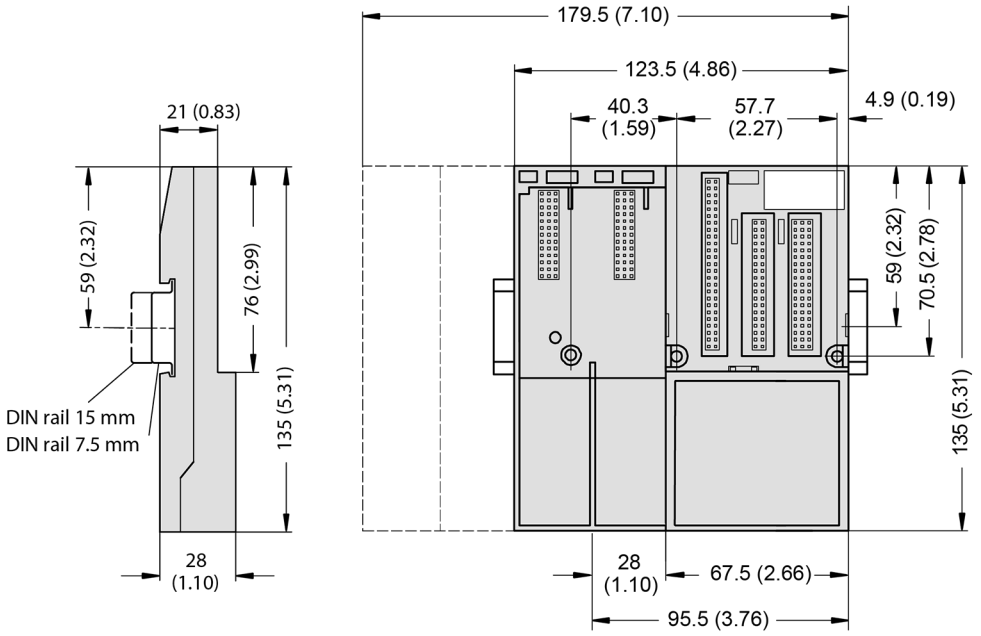
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

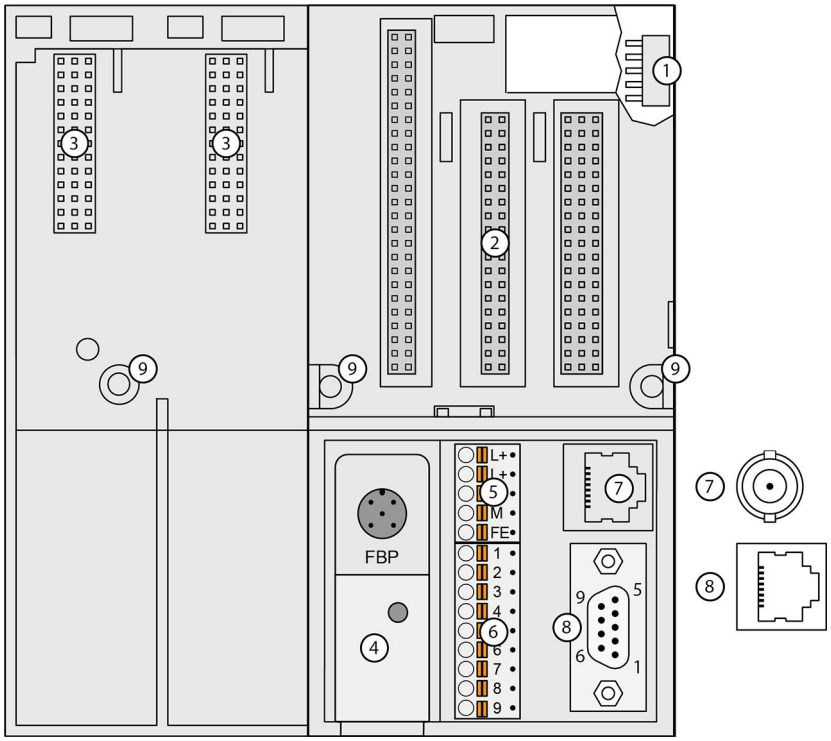
124.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

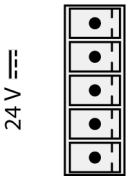
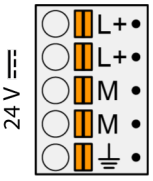
124.5 Connections



1 I/O bus (10-pin, female) to connect the I/O terminal units
2 One available slot for the processor module
3 Slots for communication modules (TB511-xxx: 1 slot, TB521-xxx: 2 slots, TB541-xx: 4 slots)
4 Interface for FieldBusPlug, not for terminal base TB523-2ETH
5 Power supply (5-pin terminal block, removable)
6 Serial interface COM1 (9-pin terminal block, removable)
7 Network interfaces: TB5xx-ETH: Ethernet, TB5xx-ARCNET: ARCNET
8 TB5x1: Serial interface COM2 (D-sub 9, female), TB523-2ETH: second Ethernet network interface
9 Holes for screw mounting

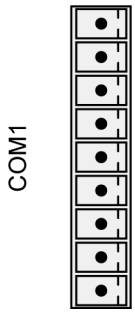
124.5.1 Power supply

Pin assignment

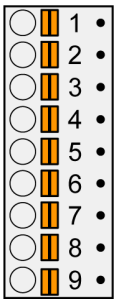
Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

124.5.2 Serial interface COM1

Pin assignment (RS-485 / RS-232)



Terminal block removed



Terminal block inserted

Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

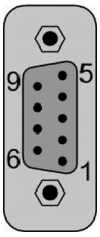
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

124.5.3 Serial interface COM2

Pin assignment



Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

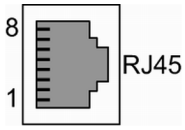
Protect unused connectors and slots with TA535 protective caps for XC devices.

124.5.4 ARCNET network interface



124.5.5 Ethernet network interface

Pin assignment

	PIN	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

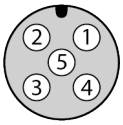
Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

124.5.6 Neutral FBP interface

Pin assignment in serial mode

FieldBusPlug	Pin	Signal	Description
	1	+24 V	Standard power supply
	2	Diagnosis pin	
	3	0 V	Standard power supply
	4	Serial data	
	5	Serial data	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

124.6 Wiring

Proper wires and tools

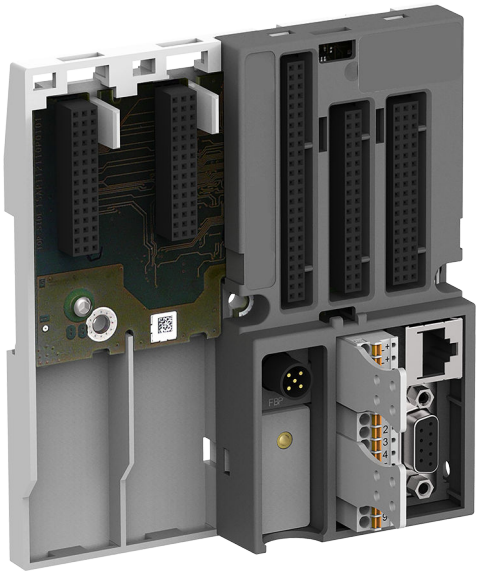
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TB5xx, TB56xx (Supply, COM1)	10 mm	X	-	0.5 x 3 mm	0.08 - 1.5 mm^2

125 TB521-x(-XC)

- TB521-ARCNET
- TB521-ETH
- TB521-ETH-XC



CAUTION!

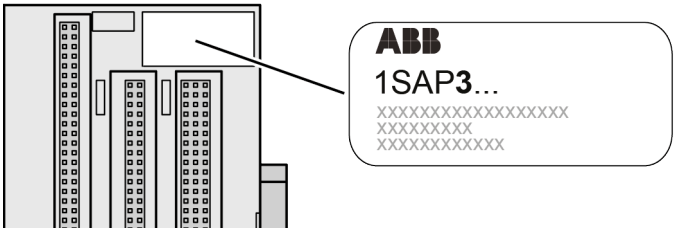
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

XC version

XC = e**X**treme **C**onditions

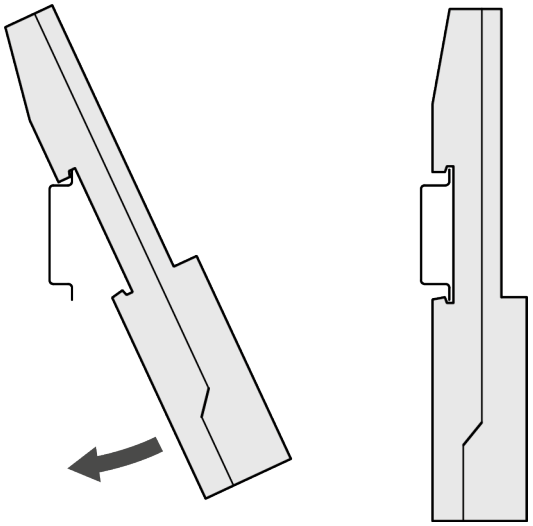


Extreme conditions

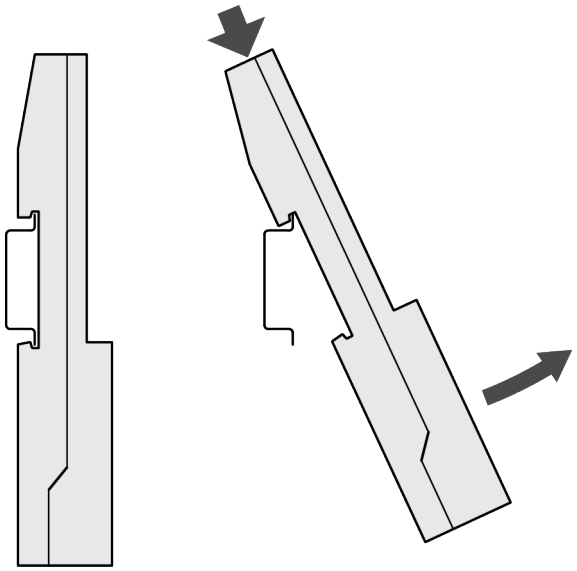
Terminal bases for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **3** in the Part no. 1SAP**3**... (label) identifies the XC version.*

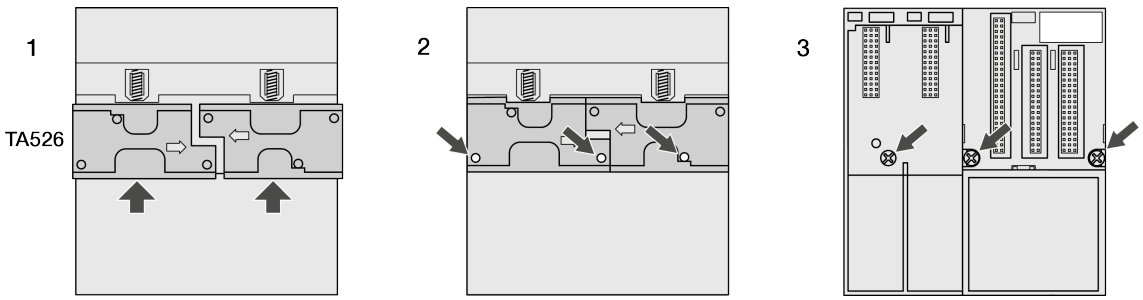
125.1 Assembly



125.2 Disassembly



125.3 Assembly with screws



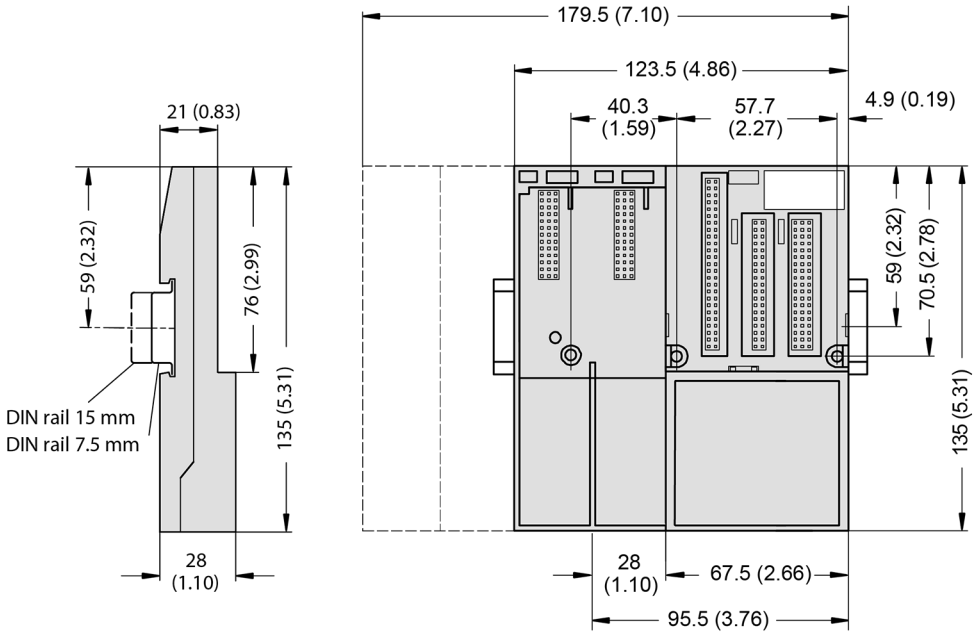
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

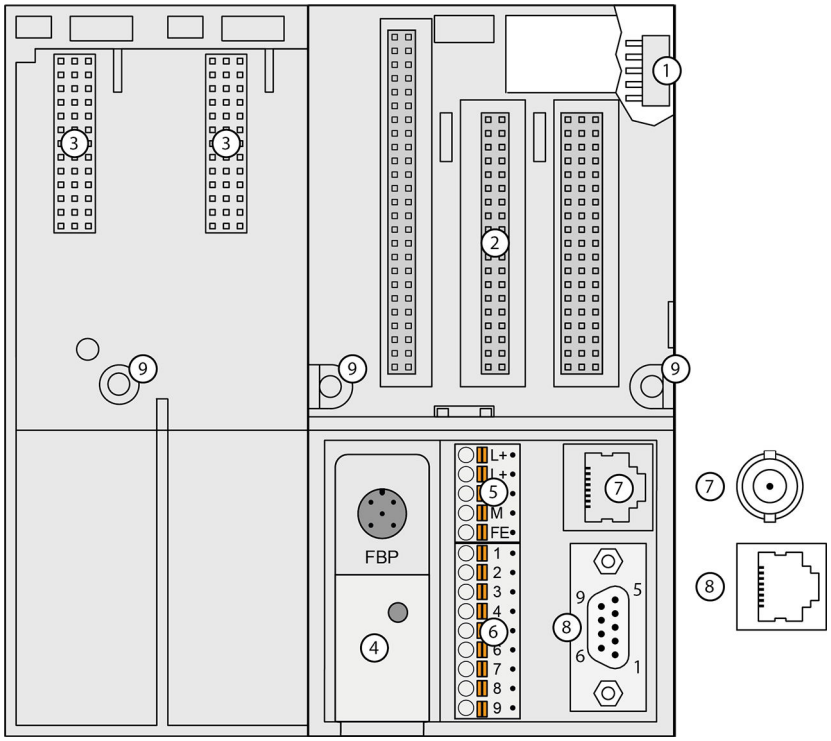
125.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

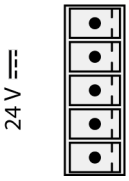
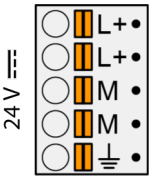
125.5 Connections



1 I/O bus (10-pin, female) to connect the I/O terminal units
2 One available slot for the processor module
3 Slots for communication modules (TB511-xxx: 1 slot, TB521-xxx: 2 slots, TB541-xx: 4 slots)
4 Interface for FieldBusPlug, not for terminal base TB523-2ETH
5 Power supply (5-pin terminal block, removable)
6 Serial interface COM1 (9-pin terminal block, removable)
7 Network interfaces: TB5xx-ETH: Ethernet, TB5xx-ARCNET: ARCNET
8 TB5x1: Serial interface COM2 (D-sub 9, female), TB523-2ETH: second Ethernet network interface
9 Holes for screw mounting

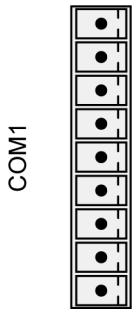
125.5.1 Power supply

Pin assignment

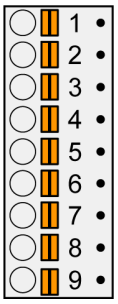
Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

125.5.2 Serial interface COM1

Pin assignment (RS-485 / RS-232)



Terminal block removed



Terminal block inserted

Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

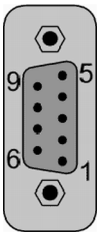
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

125.5.3 Serial interface COM2

Pin assignment



Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

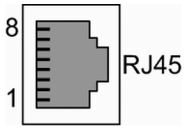
Protect unused connectors and slots with TA535 protective caps for XC devices.

125.5.4 ARCNET network interface



125.5.5 Ethernet network interface

Pin assignment

	PIN	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

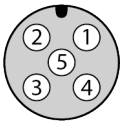
Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

125.5.6 Neutral FBP interface

Pin assignment in serial mode

FieldBusPlug	Pin	Signal	Description
	1	+24 V	Standard power supply
	2	Diagnosis pin	
	3	0 V	Standard power supply
	4	Serial data	
	5	Serial data	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

125.6 Wiring

Proper wires and tools

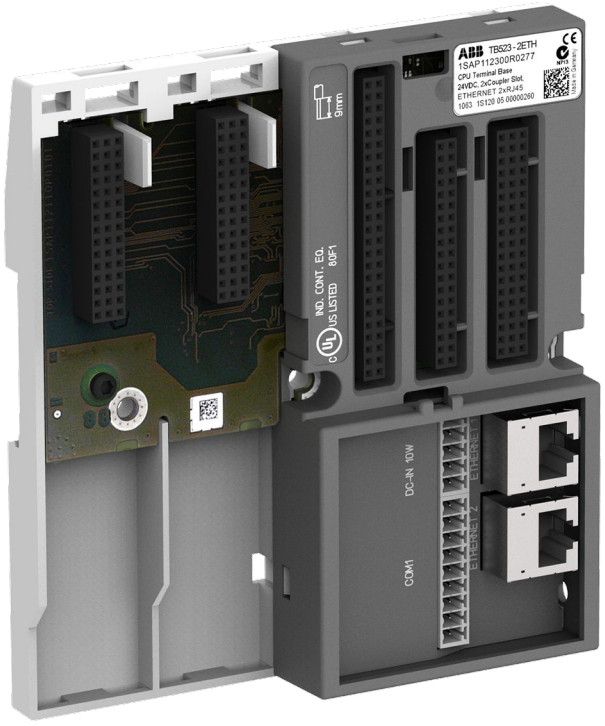
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TB5xx, TB56xx (Supply, COM1)	10 mm	X	-	0.5 x 3 mm	0.08 - 1.5 mm^2

126 TB523-2ETH

- TB523-2ETH



CAUTION!

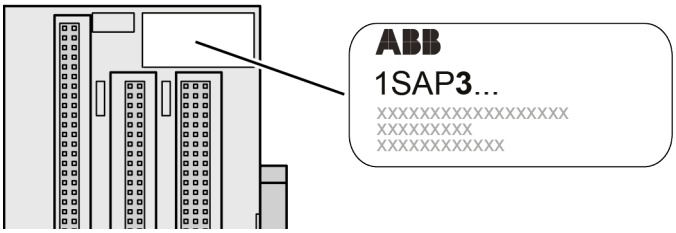
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

XC version

XC = e**X**treme **C**onditions

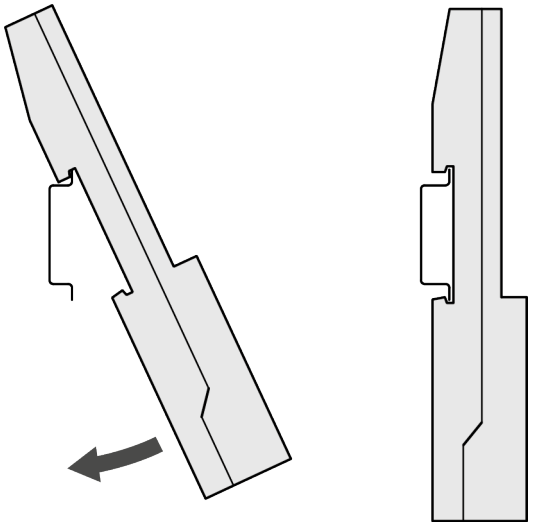


Extreme conditions

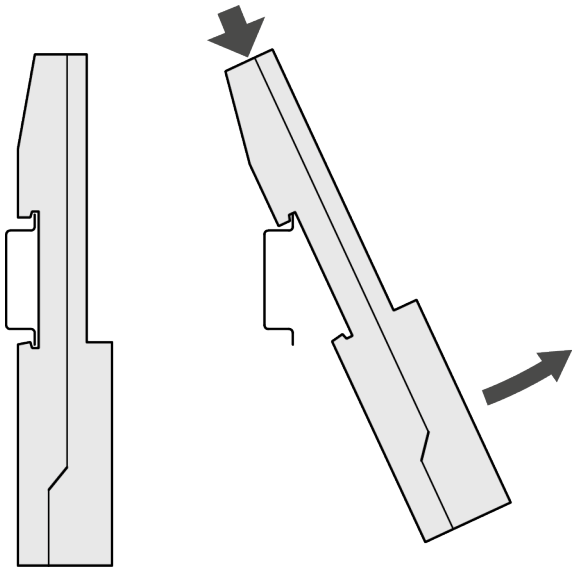
Terminal bases for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **3** in the Part no. 1SAP**3**... (label) identifies the XC version.*

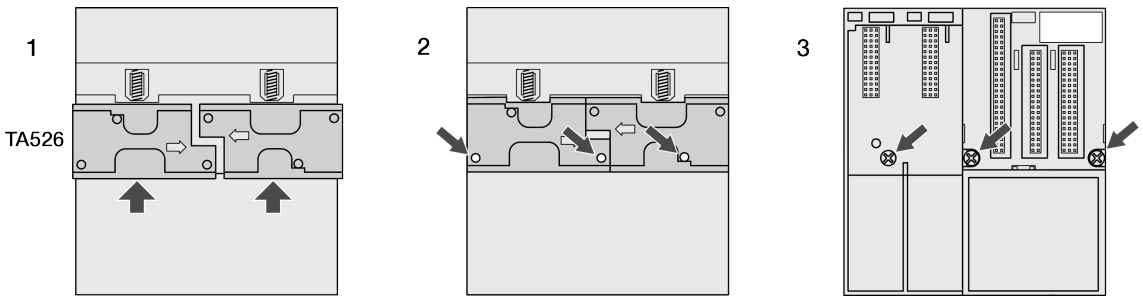
126.1 Assembly



126.2 Disassembly



126.3 Assembly with screws



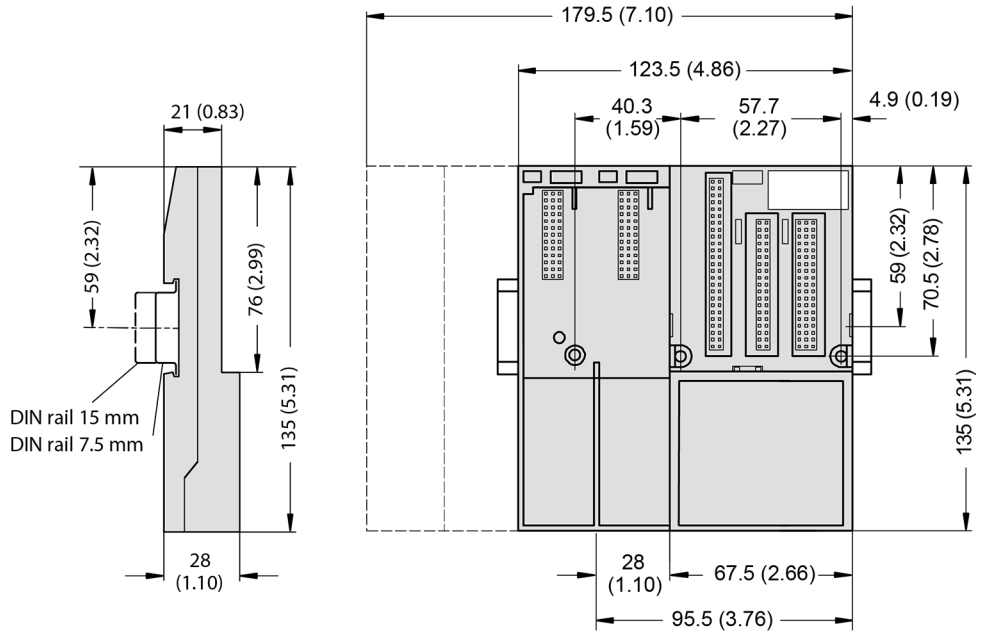
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

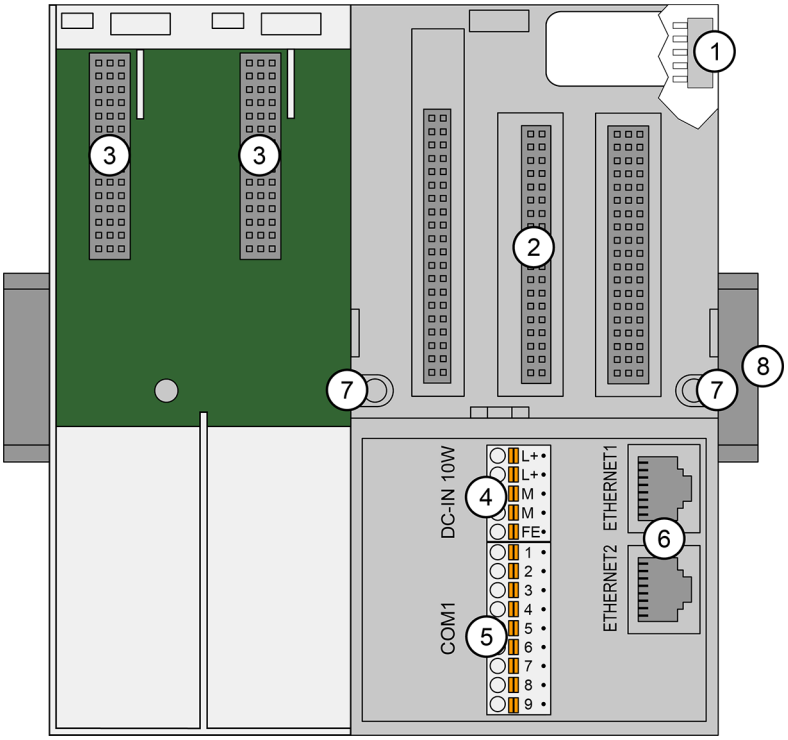
126.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

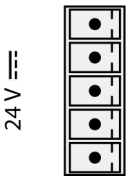
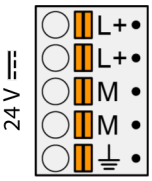
126.5 Connections



1 I/O bus (10-pin, female) to connect the I/O terminal units
2 One available slot for the processor module
3 Slots for communication modules
4 Power supply (5-pin terminal block, removable)
5 Serial interface COM1 (9-pin terminal block, removable)
6 Ethernet network interfaces
7 Holes for wall mounting with screws
8 DIN rail

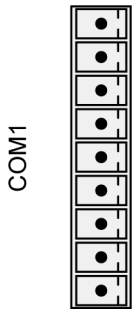
126.5.1 Power supply

Pin assignment

Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

126.5.2 Serial interface COM1

Pin assignment (RS-485 / RS-232)



Terminal block removed

Terminal block inserted

Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

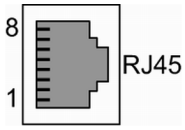
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

126.5.3 Ethernet network interface

Pin assignment



PIN	Signal	Description
1	TxD+	Transmit data +
2	TxD-	Transmit data -
3	RxD+	Receive data +
4	NU	Not used
5	NU	Not used
6	RxD-	Receive data -
7	NU	Not used
8	NU	Not used
Shield	Cable shield	Functional earth

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

126.6 Wiring

Proper wires and tools

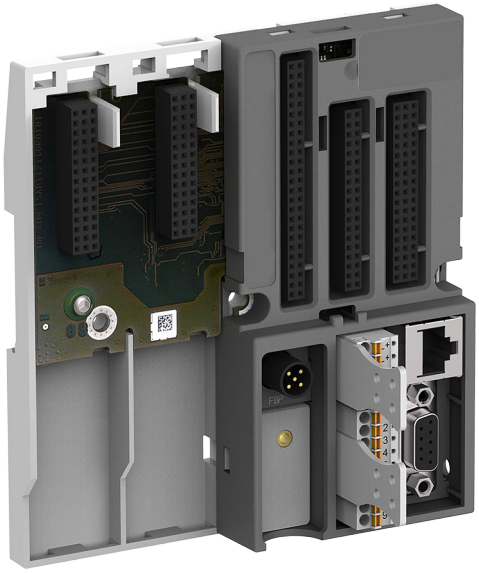
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TB5xx, TB56xx (Supply, COM1)	10 mm	X	-	0.5 x 3 mm	0.08 - 1.5 mm^2

127 TB541-ETH(-XC)

- TB541-ETH
- TB541-ETH-XC



CAUTION!

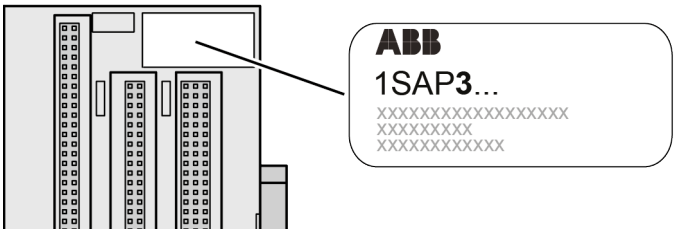
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

XC version

XC = e**X**treme **C**onditions

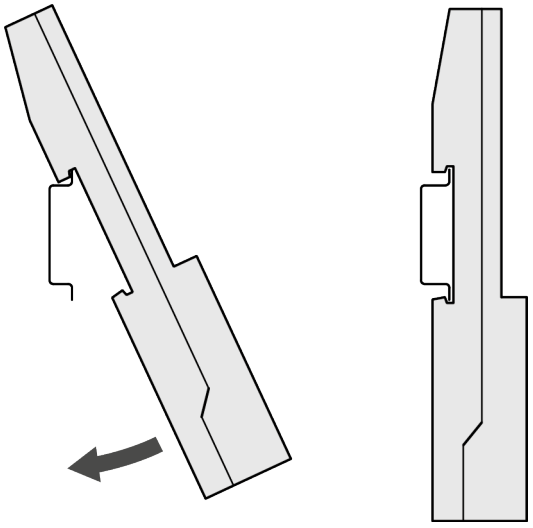


Extreme conditions

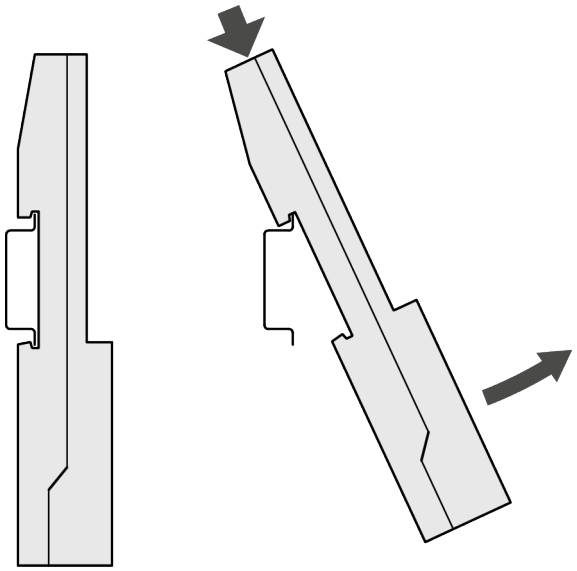
Terminal bases for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **3** in the Part no. 1SAP**3**... (label) identifies the XC version.*

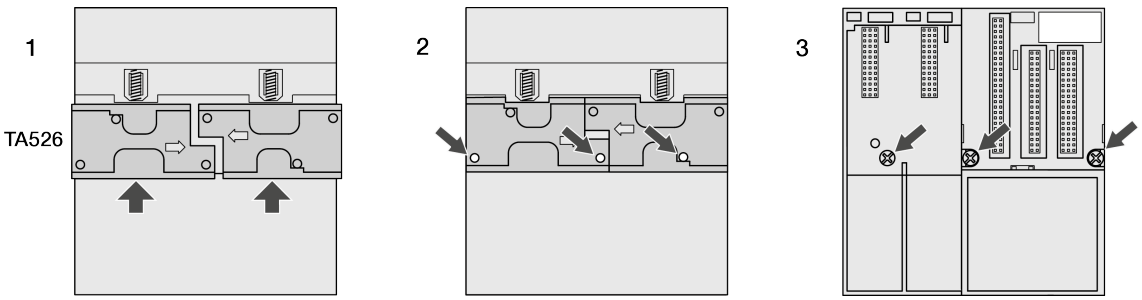
127.1 Assembly



127.2 Disassembly



127.3 Assembly with screws



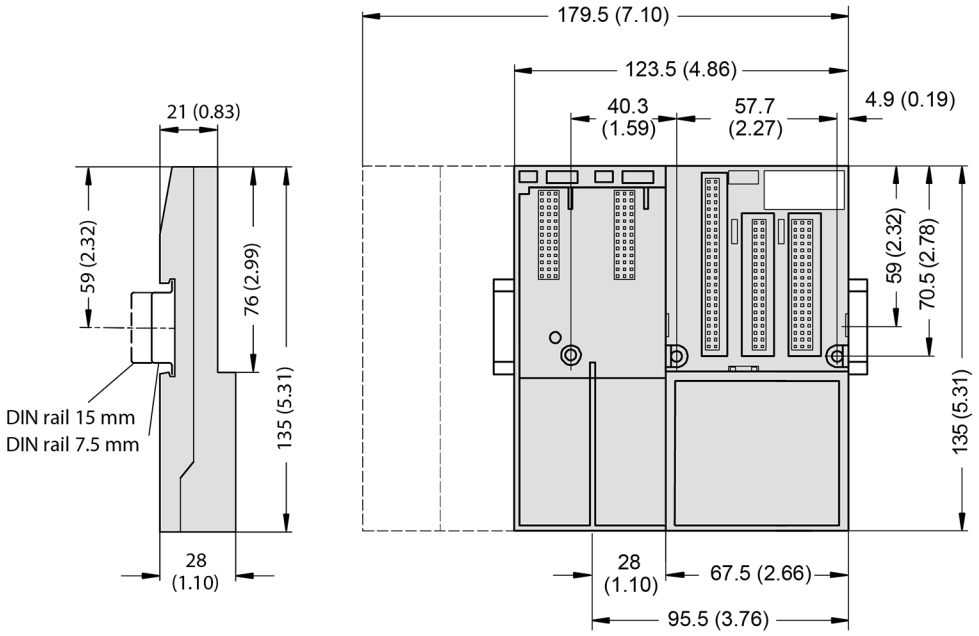
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

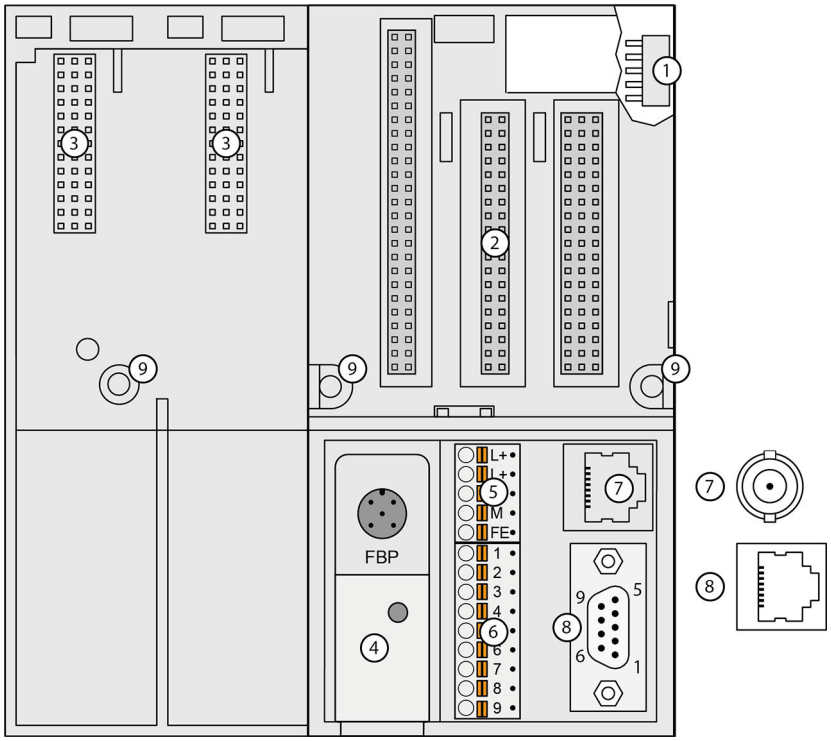
127.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

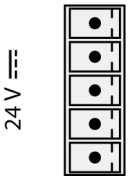
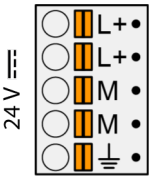
127.5 Connections



1 I/O bus (10-pin, female) to connect the I/O terminal units
2 One available slot for the processor module
3 Slots for communication modules (TB511-xxx: 1 slot, TB521-xxx: 2 slots, TB541-xx: 4 slots)
4 Interface for FieldBusPlug, not for terminal base TB523-2ETH
5 Power supply (5-pin terminal block, removable)
6 Serial interface COM1 (9-pin terminal block, removable)
7 Network interfaces: TB5xx-ETH: Ethernet, TB5xx-ARCNET: ARCNET
8 TB5x1: Serial interface COM2 (D-sub 9, female), TB523-2ETH: second Ethernet network interface
9 Holes for screw mounting

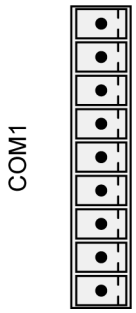
127.5.1 Power supply

Pin assignment

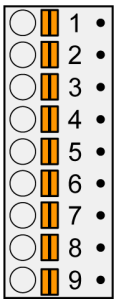
Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

127.5.2 Serial interface COM1

Pin assignment (RS-485 / RS-232)



Terminal block removed



Terminal block inserted

Pin	Signal	Interface	Description
1	Terminator P	RS-485	Terminator P
2	RxD/TxD-P	RS-485	Receive/Transmit, positive
3	RxD/TxD-N	RS-485	Receive/Transmit, negative
4	Terminator N	RS-485	Terminator N
5	RTS	RS-232	Request to send (output)
6	TxD	RS-232	Transmit data (output)
7	SGND	Signal Ground	Signal Ground
8	RxD	RS-232	Receive data (input)
9	CTS	RS-232	Clear to send (input)

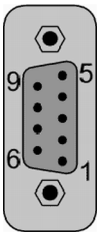
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

127.5.3 Serial interface COM2

Pin assignment



Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

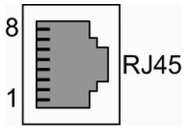
Protect unused connectors and slots with TA535 protective caps for XC devices.

127.5.4 ARCNET network interface



127.5.5 Ethernet network interface

Pin assignment

	PIN	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

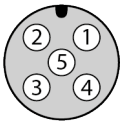
Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

127.5.6 Neutral FBP interface

Pin assignment in serial mode

FieldBusPlug	Pin	Signal	Description
	1	+24 V	Standard power supply
	2	Diagnosis pin	
	3	0 V	Standard power supply
	4	Serial data	
	5	Serial data	

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

127.6 Wiring

Proper wires and tools

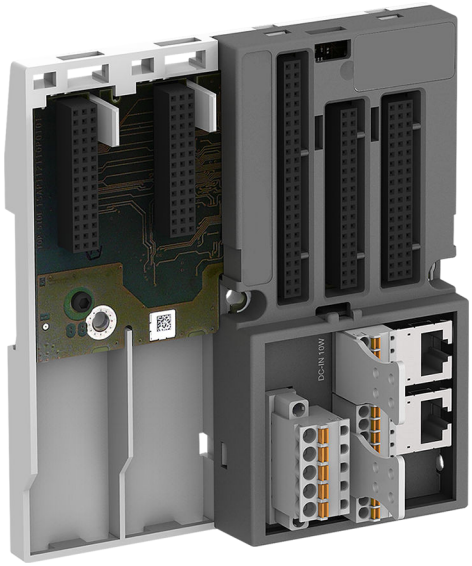
Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

> **NOTICE!**
>
> **Risk of damaging the device**
>
> Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TB5xx, TB56xx (Supply, COM1)	10 mm	X	-	0.5 x 3 mm	0.08 - 1.5 mm^2

128 TB56xx-2ETH(-XC)

- TB5600-2ETH
- TB5600-2ETH-XC
- TB5610-2ETH
- TB5610-2ETH-XC
- TB5620-2ETH
- TB5620-2ETH-XC
- TB5640-2ETH
- TB5640-2ETH-XC
- TB5660-2ETH
- TB5660-2ETH-XC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

Processor modules PM56xx-2ETH can only be used with TB56xx-2ETH terminal bases.

Table 110: Combination of TB56xx-2ETH(-XC) and PM56xx(-XC)

Processor module	PM5630	PM5650	PM5670	PM5675	PM5680 [2]	PM5685 [2]
TB5600-2ETH	0 slot	0 slot	0 slot	0 slot	0 slot	0 slot
TB5610-2ETH	1 slot	1 slot	1 slot	1 slot	1 slot	1 slot
TB5620-2ETH	2 slots	2 slots	2 slots	2 slots	2 slots	2 slots
TB5640-2ETH	-	4 slots	4 slots	4 slots	4 slots	4 slots
TB5660-2ETH	-	-	6 slots [1]	6 slots [1]	-	6 slots

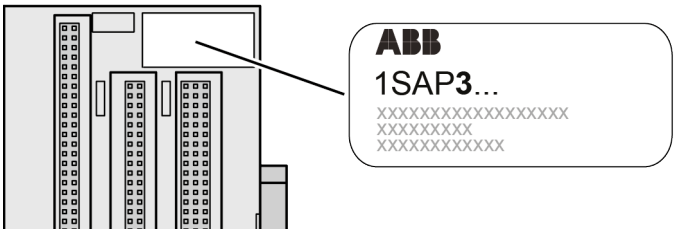
Remarks:

The slots can be used for connecting communication modules or AC500-S modules. Note that only one AC500-S module can be connected at one terminal base.

[1] PM567x must have the order numbers 1SAP151000R0378, 1SAP151500R0378 or a production index ≥ C0.

[2] XC variant is not applicable.

XC version **XC** = e**X**treme **C**onditions

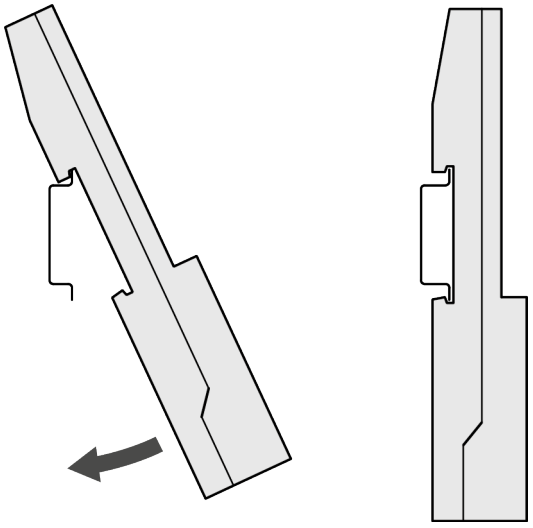


Extreme conditions

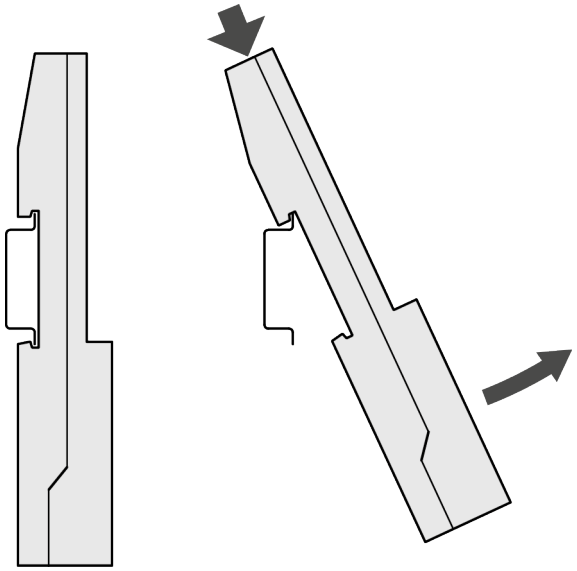
Terminal bases for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **3** in the Part no. 1SAP**3**... (label) identifies the XC version.*

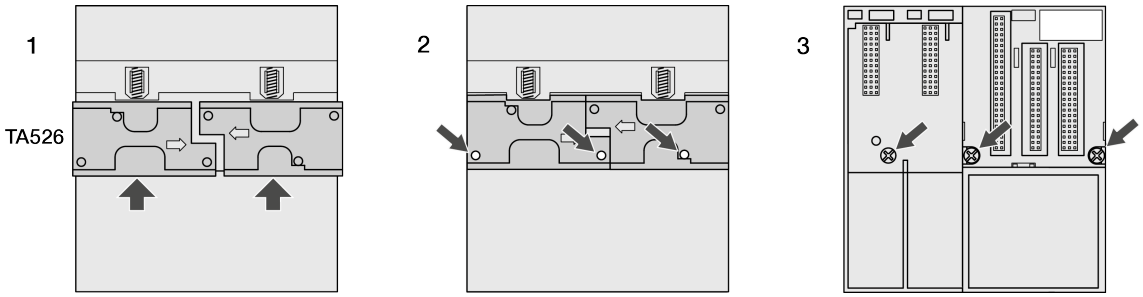
128.1 Assembly



128.2 Disassembly



128.3 Assembly with screws



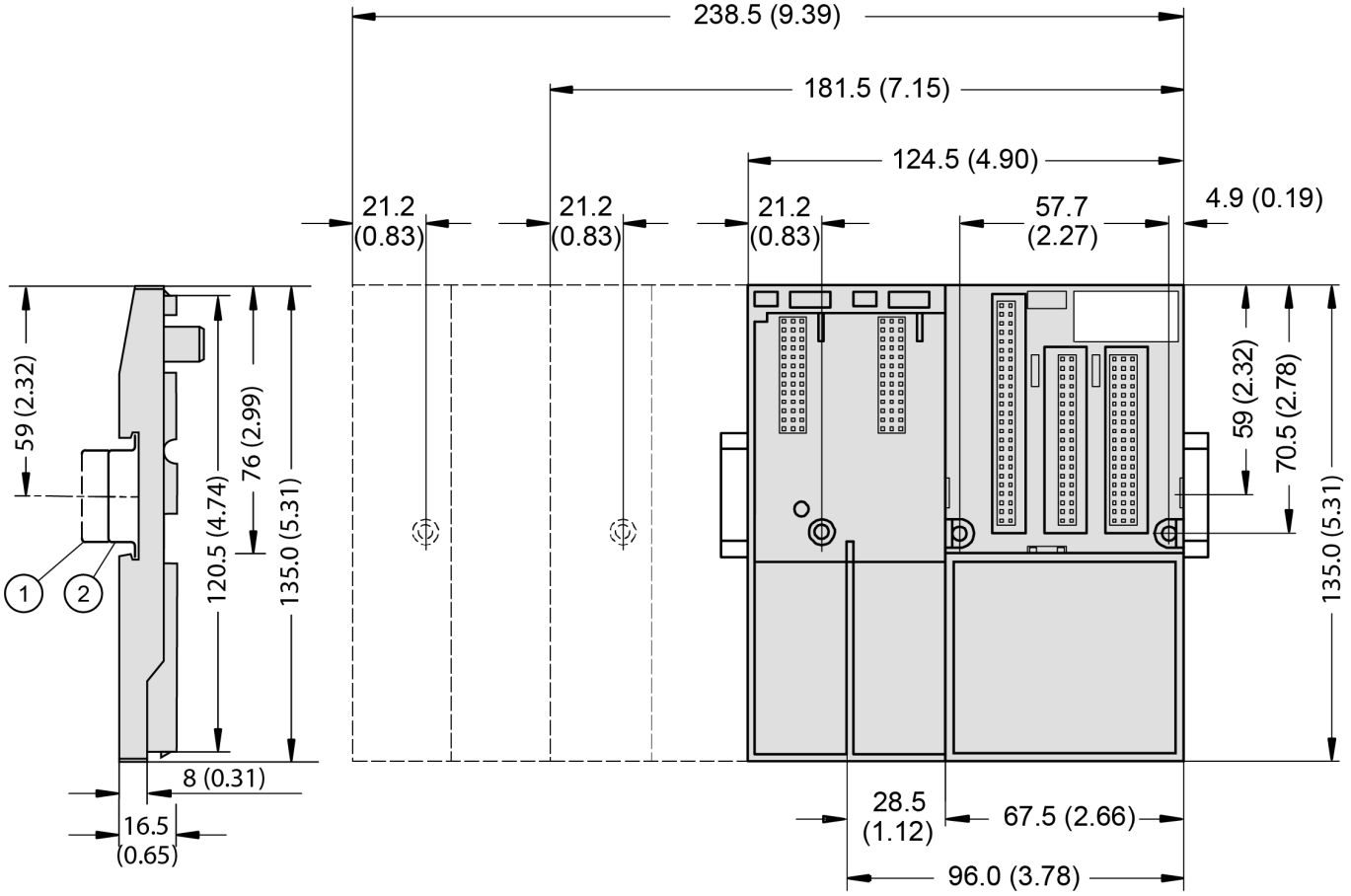
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

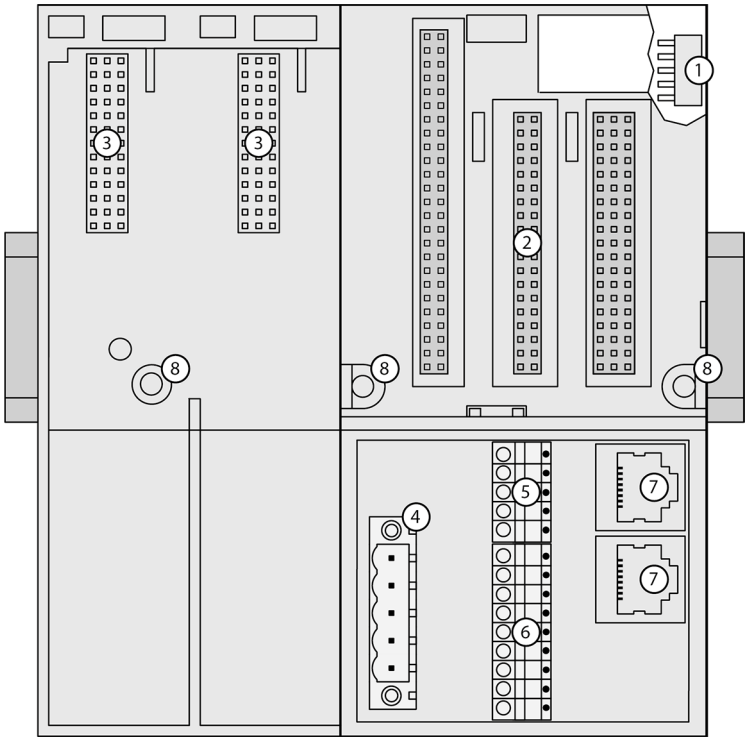
128.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

128.5 Connections

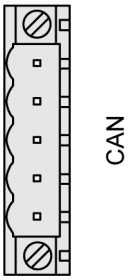
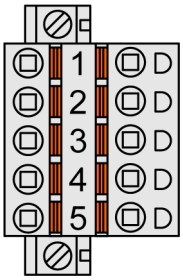


1 I/O bus (10-pin, female) to connect the I/O terminal units
2 One available slot for the processor module
3 Slots for communication modules
4 Interface for CAN (5-pin terminal block, removable)
5 Power supply (5-pin terminal block, removable)
6 Serial interface COM1 (9-pin terminal block, removable)
7 RJ45 female connector for Ethernet connection
8 Holes for screw mounting

128.5.1 CAN interface

Pin assignment

Table 111: Pin assignment of the CANopen connector

Interface		PIN	Signal	Description
 Terminal block removed	 Terminal block inserted	1	CAN_GND	CAN reference potential
		2	CAN_L	Bus line, receive/transmit line, LOW
		3	CAN_SHLD	Shield of the bus line
		4	CAN_H	Bus line, receive/transmit line, HIGH
		5	NC	Not connected

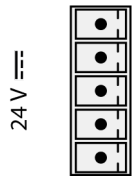
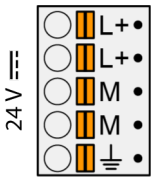
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

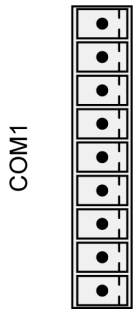
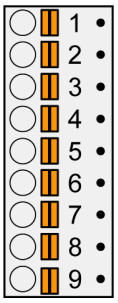
128.5.2 Power supply

Pin assignment

Pin Assignment		Label	Function	Description
 Terminal block removed	 Terminal block inserted	L+	+24 V DC	Positive pin of the power supply voltage
		L+	+24 V DC	Positive pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		M	0 V	Negative pin of the power supply voltage
		⏚	FE	Functional earth

128.5.3 Serial interface COM1

Pin assignment (RS-485 / RS-232)

		Pin	Signal	Interface	Description
 Terminal block removed	 Terminal block inserted	1	Terminator P	RS-485	Terminator P
		2	RxD/TxD-P	RS-485	Receive/Transmit, positive
		3	RxD/TxD-N	RS-485	Receive/Transmit, negative
		4	Terminator N	RS-485	Terminator N
		5	RTS	RS-232	Request to send (output)
		6	TxD	RS-232	Transmit data (output)
		7	SGND	Signal Ground	Signal Ground
		8	RxD	RS-232	Receive data (input)
		9	CTS	RS-232	Clear to send (input)

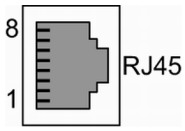
NOTICE!

Unused connector!

Make sure that the terminal block is always connected to the terminal base or communication module, even if you do not use the interface.

128.5.4 Ethernet network interface

Pin assignment

	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

128.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

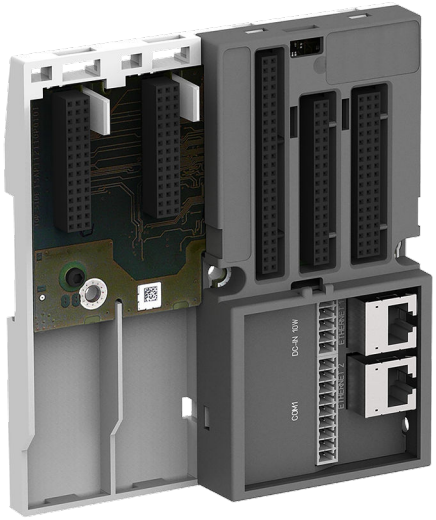
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TB5xx, TB56xx (Supply, COM1)	10 mm	X	-	0.5 x 3 mm	0.08 - 1.5 mm^2

129 TF501-CMS(-XC)

- TF501-CMS
- TF501-CMS-XC



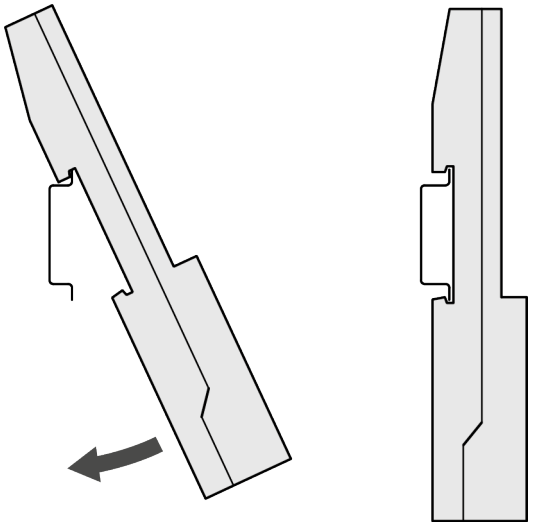
CAUTION!

Risk of injury and damaging the product!

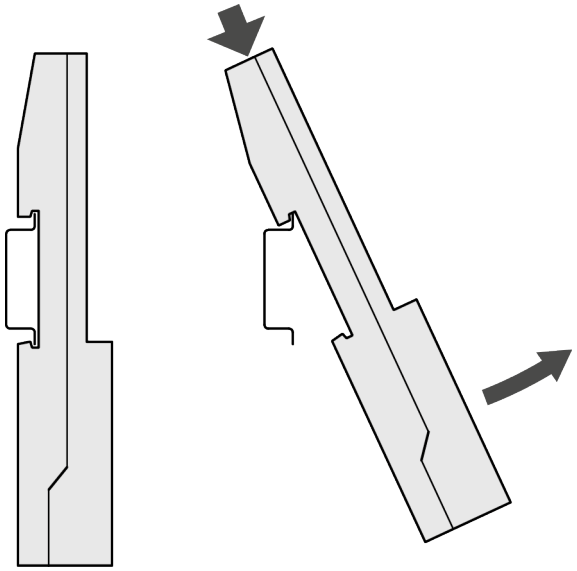
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

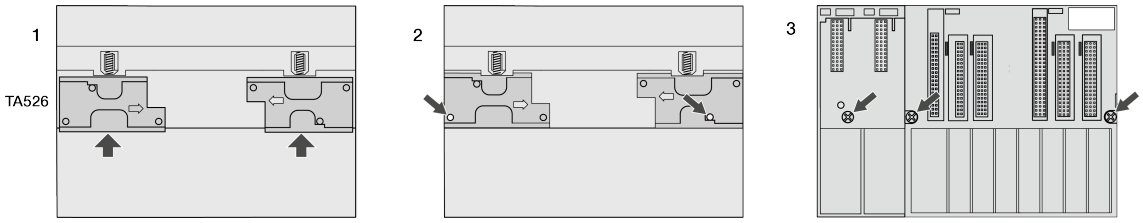
129.1 Assembly



129.2 Disassembly



129.3 Assembly with screws



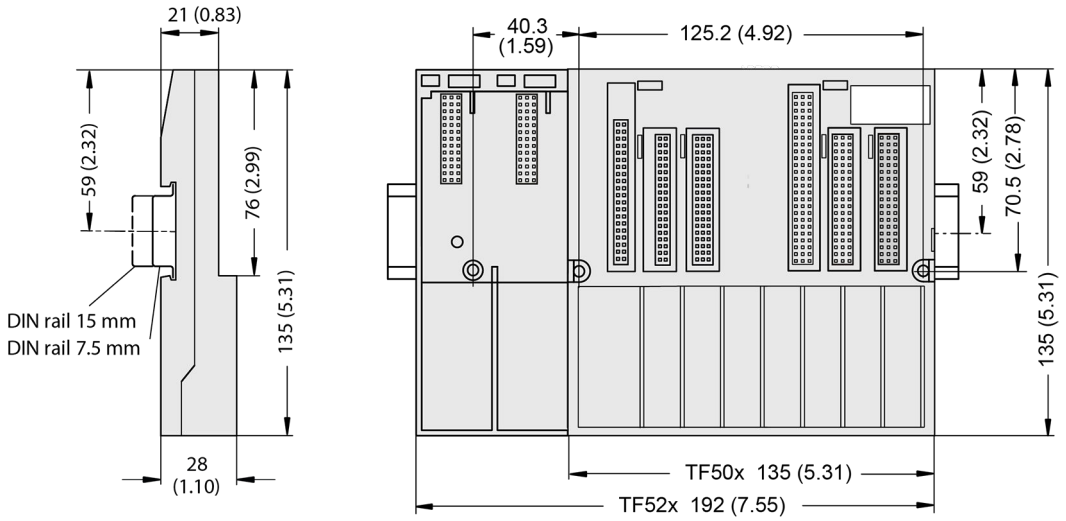
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

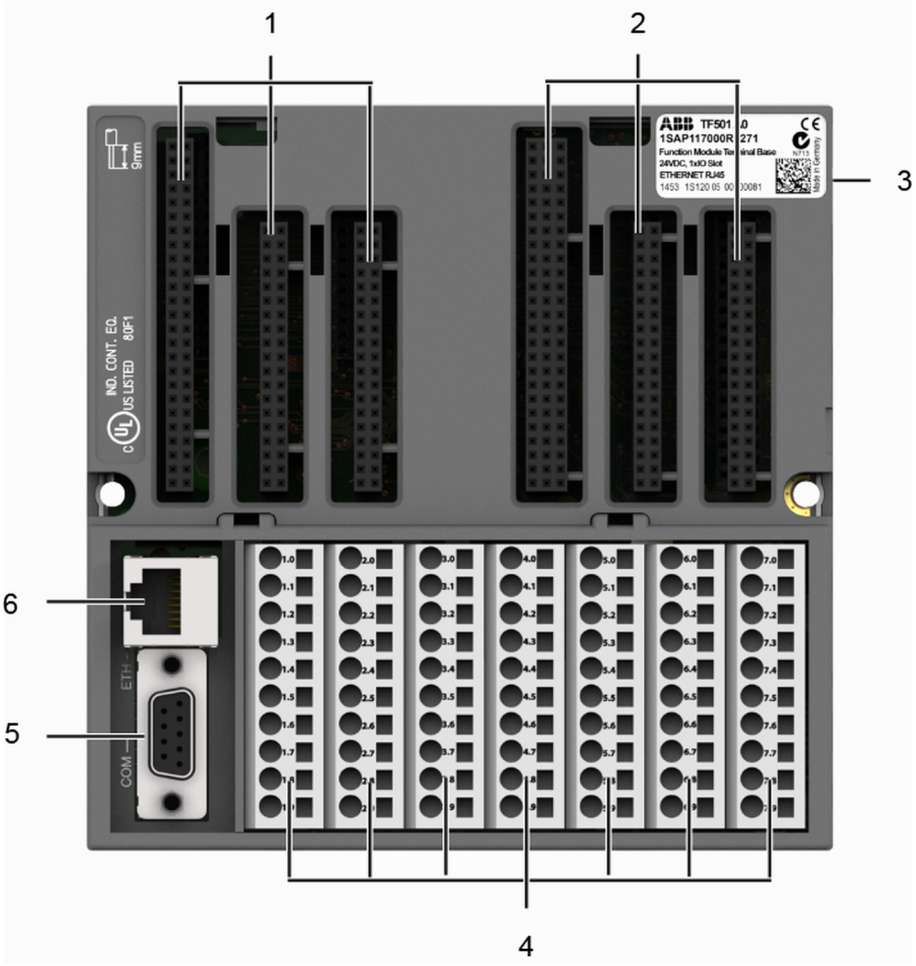
1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

129.4 Dimensions



The dimensions are in mm and in brackets in inch.

129.5 Connections



1 Slots for PM592-ETH
2 Slots for FM502-CMS
3 I/O bus to galvanically connect the terminal units
4 Terminal blocks for analog/digital inputs/outputs
5 Serial interface COM1
6 Ethernet network interface

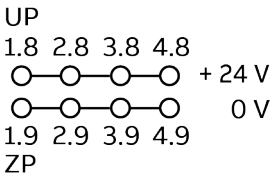
> *All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.*

Table 112: Function module terminal base - pin assignment

1.0 FE	2.0 AI0-	3.0 AI0+	4.0 SH	5.0 AI8-	6.0 AI8+	7.0 SH
1.1 A+	2.1 AI1-	3.1 AI1+	4.1 SH	5.1 AI9-	6.1 AI9+	7.1 SH
1.2 A-	2.2 AI2-	3.2 AI2+	4.2 SH	5.2 AI10-	6.2 AI10+	7.2 SH
1.3 B+	2.3 AI3-	3.3 AI3+	4.3 SH	5.3 AI11-	6.3 AI11+	7.3 SH
1.4 B-	2.4 AI4-	3.4 AI4+	4.4 SH	5.4 AI12-	6.4 AI12+	7.4 SH
1.5 Z+	2.5 AI5-	3.5 AI5+	4.5 SH	5.5 AI13-	6.5 AI13+	7.5 SH
1.6 Z-	2.6 AI6-	3.6 AI6+	4.6 SH	5.6 AI14-	6.6 AI14+	7.6 SH
1.7 5V	2.7 AI7-	3.7 AI7+	4.7 SH	5.7 AI15-	6.7 AI15+	7.7 SH

1.8 L+	2.8 DI0	3.8 DC2	4.8 L+	5.8 L+	6.8 L+	7.8 L+
1.9 M	2.9 DI1	3.9 DC3	4.9 M	5.9 M	6.9 M	7.9 M

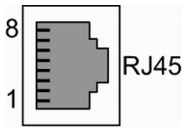
129.5.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

129.5.2 Ethernet network interface

Pin assignment



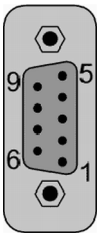
PIN	Signal	Description
1	TxD+	Transmit data +
2	TxD-	Transmit data -
3	RxD+	Receive data +
4	NU	Not used
5	NU	Not used
6	RxD-	Receive data -
7	NU	Not used
8	NU	Not used
Shield	Cable shield	Functional earth

NOTICE!
Risk of corrosion!
Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

129.5.3 Serial interface COM1

Pin assignment

Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

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129.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2

130 TF521-CMS(-XC)

- TF521-CMS
- TF521-CMS-XC



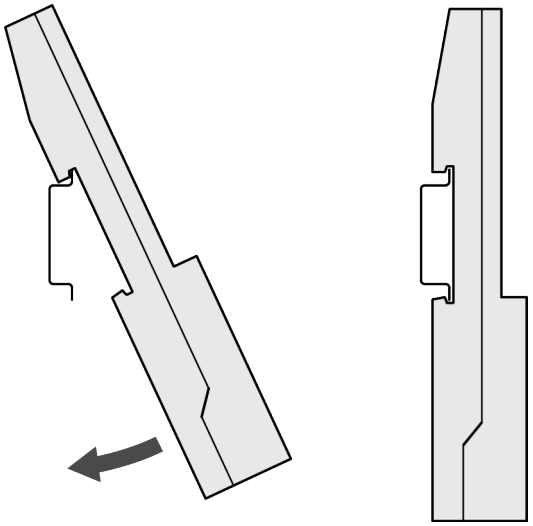
CAUTION!

Risk of injury and damaging the product!

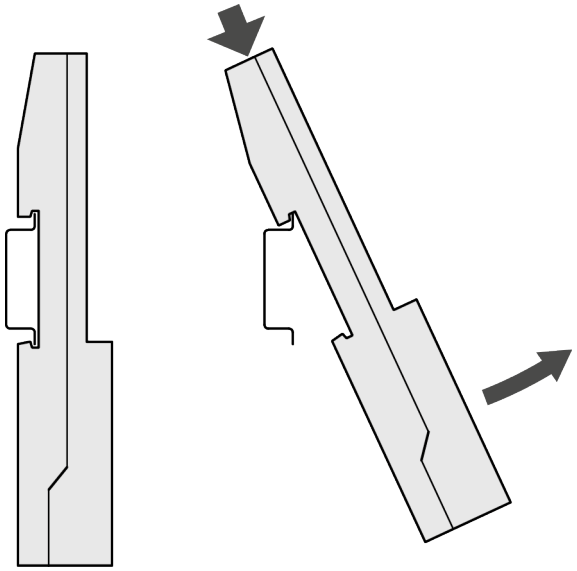
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

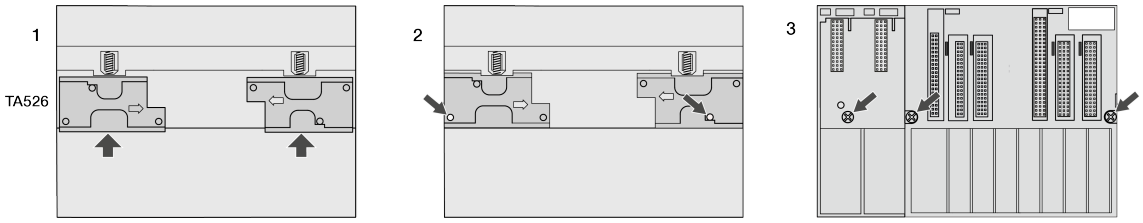
130.1 Assembly



130.2 Disassembly



130.3 Assembly with screws



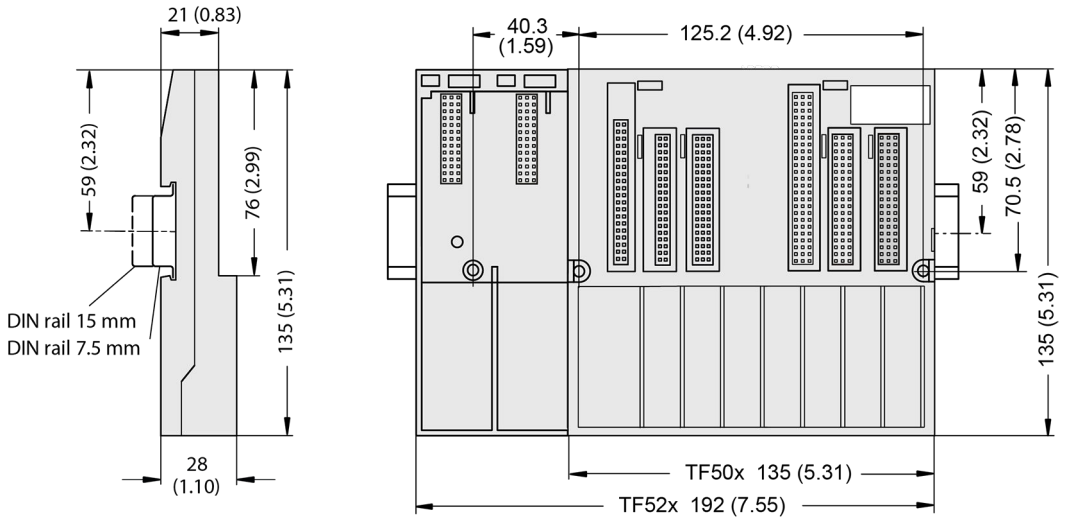
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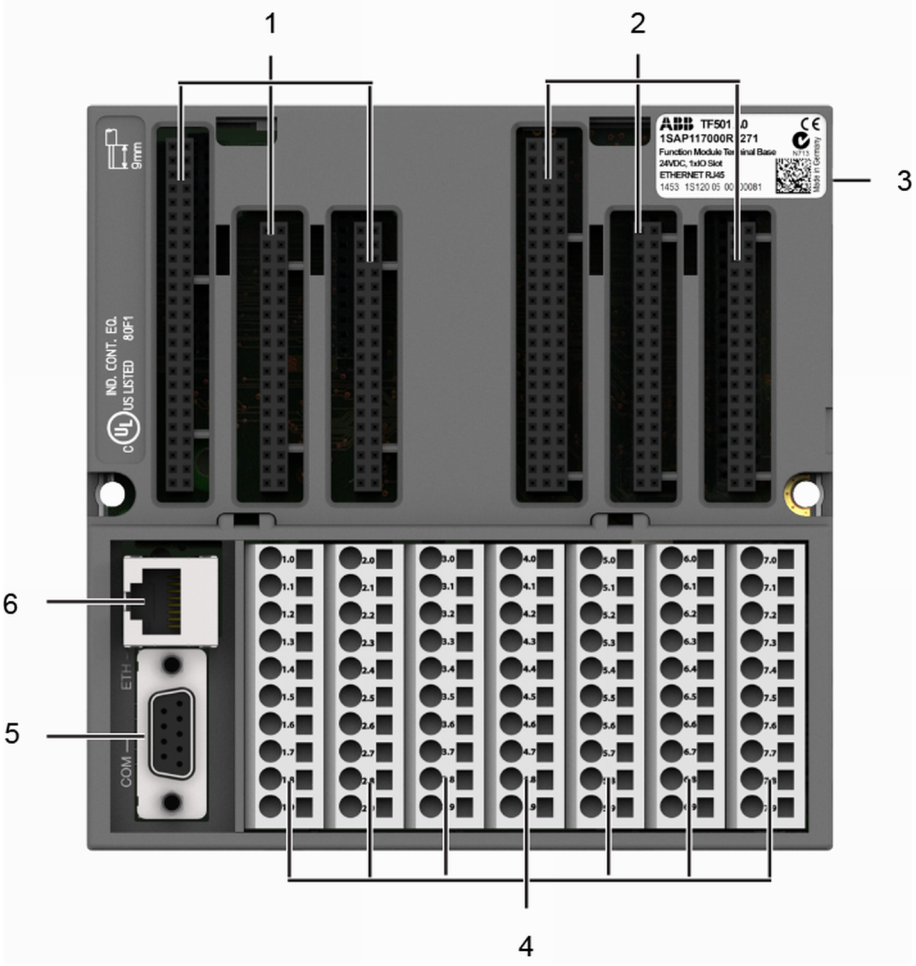
1. TA526 are snapped on the rear side of the module like DIN rails. One TA526 is turned by 180°.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

130.4 Dimensions



The dimensions are in mm and in brackets in inch.

130.5 Connections



1 Slots for PM592-ETH
2 Slots for FM502-CMS
3 I/O bus to galvanically connect the terminal units
4 Terminal blocks for analog/digital inputs/outputs
5 Serial interface COM1
6 Ethernet network interface

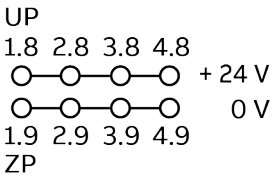
> *All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.*

Table 113: Function module terminal base - pin assignment

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1.1 A+	2.1 AI1-	3.1 AI1+	4.1 SH	5.1 AI9-	6.1 AI9+	7.1 SH
1.2 A-	2.2 AI2-	3.2 AI2+	4.2 SH	5.2 AI10-	6.2 AI10+	7.2 SH
1.3 B+	2.3 AI3-	3.3 AI3+	4.3 SH	5.3 AI11-	6.3 AI11+	7.3 SH
1.4 B-	2.4 AI4-	3.4 AI4+	4.4 SH	5.4 AI12-	6.4 AI12+	7.4 SH
1.5 Z+	2.5 AI5-	3.5 AI5+	4.5 SH	5.5 AI13-	6.5 AI13+	7.5 SH
1.6 Z-	2.6 AI6-	3.6 AI6+	4.6 SH	5.6 AI14-	6.6 AI14+	7.6 SH
1.7 5V	2.7 AI7-	3.7 AI7+	4.7 SH	5.7 AI15-	6.7 AI15+	7.7 SH

1.8 L+	2.8 DI0	3.8 DC2	4.8 L+	5.8 L+	6.8 L+	7.8 L+
1.9 M	2.9 DI1	3.9 DC3	4.9 M	5.9 M	6.9 M	7.9 M

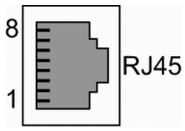
130.5.1 Process supply voltage



CAUTION!
The process supply voltage must be included in the grounding concept (e. g. grounding of the negative terminal).

130.5.2 Ethernet network interface

Pin assignment



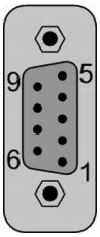
PIN	Signal	Description
1	TxD+	Transmit data +
2	TxD-	Transmit data -
3	RxD+	Receive data +
4	NU	Not used
5	NU	Not used
6	RxD-	Receive data -
7	NU	Not used
8	NU	Not used
Shield	Cable shield	Functional earth

NOTICE!
Risk of corrosion!
Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

130.5.3 Serial interface COM1

Pin assignment

Serial Interface	Pin	Signal	Interface	Description	
	1	FE	-	Functional earth	
	2	TxD	RS-232	Transmit data	Output
	3	RxD/TxD-P	RS-485	Receive/Transmit	Positive
	4	RTS	RS-232	Request to send	Output
	5	SGND	Signal ground	0 V supply out	
	6	+5 V	-	5 V supply out	
	7	RxD	RS-232	Receive data	Input
	8	RxD/TxD-N	RS-485	Receive/Transmit	Negative
	9	CTS	RS-232	Clear to send	Input
	Shield	FE	-	Functional earth	

NOTICE!

Risk of corrosion!

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Protect unused connectors and slots with TA535 protective caps for XC devices.

130.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2

131 TU507-ETH

- TU507-ETH



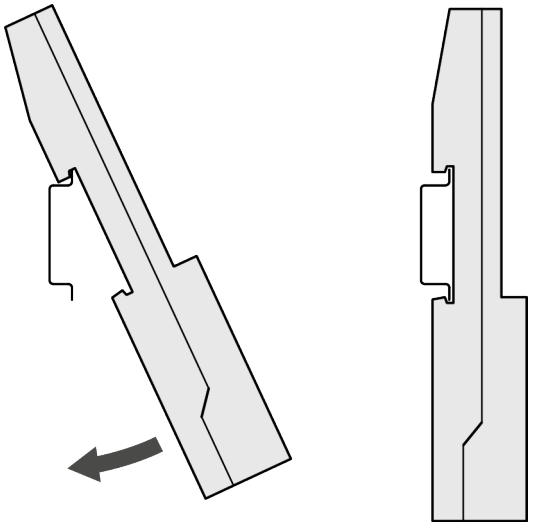
CAUTION!

Risk of injury and damaging the product!

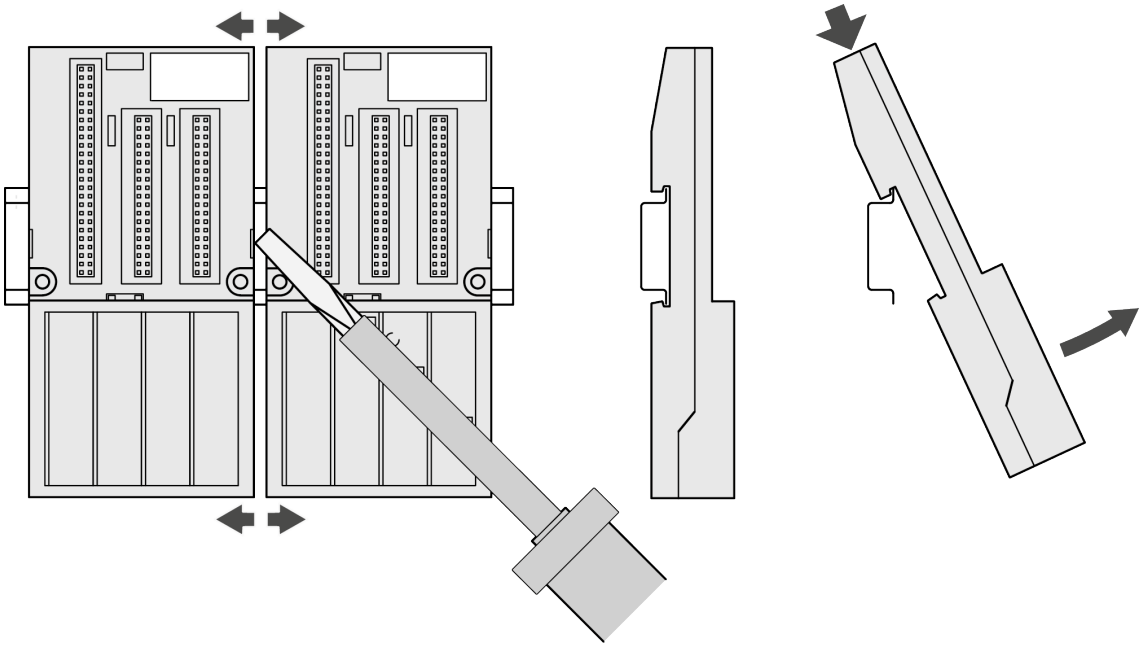
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

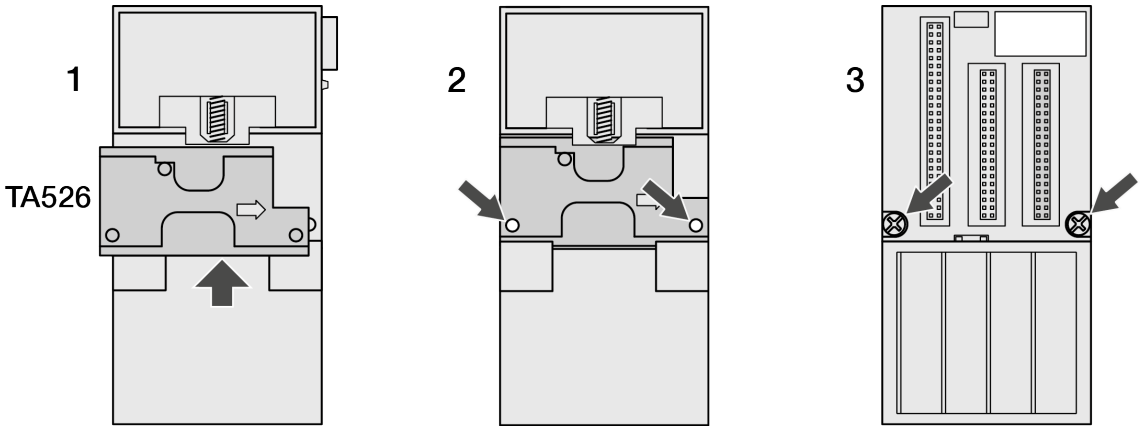
131.1 Assembly



131.2 Disassembly



131.3 Assembly with screws



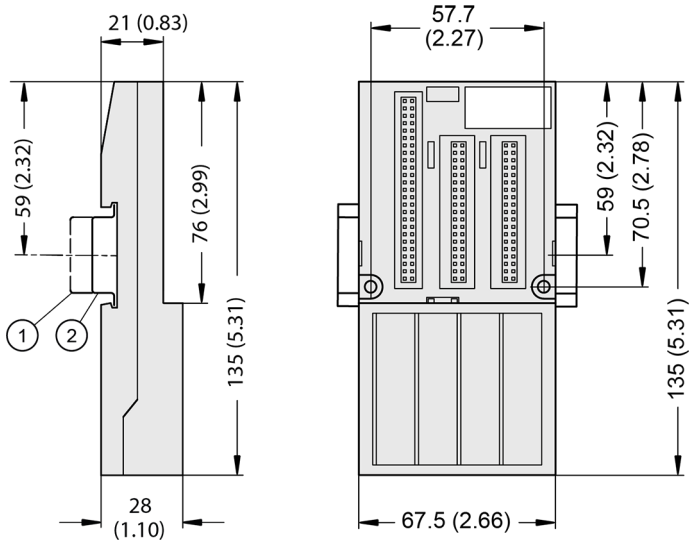
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Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

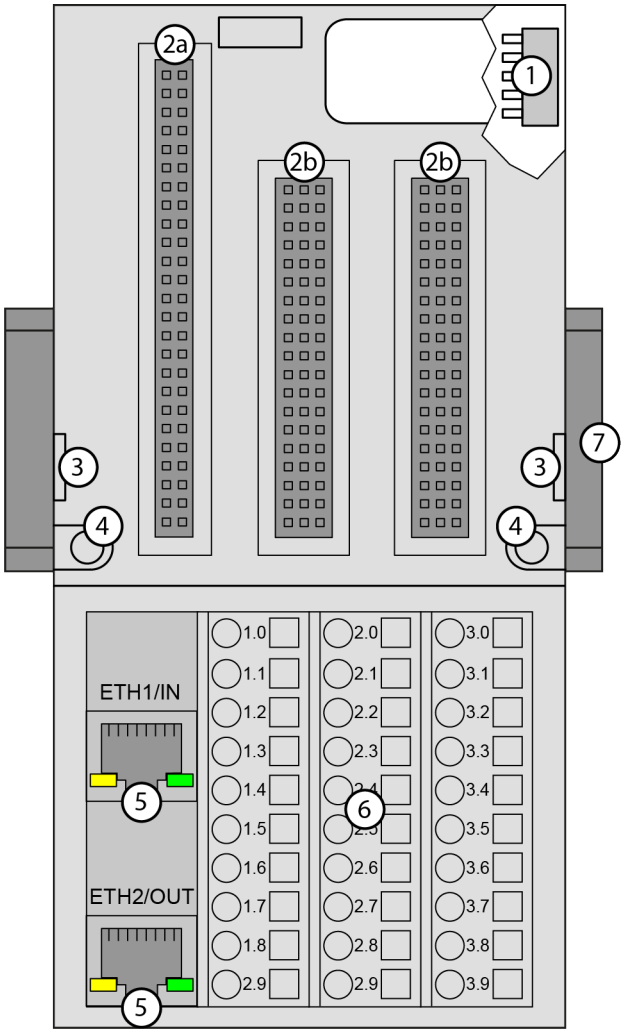
131.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

131.5 Connections

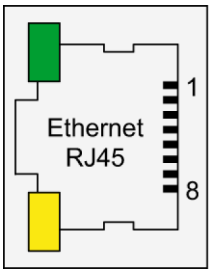


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2x 25 pins) to connect the inserted Ethernet communication interface module
2b Plug (3x 19 pins) to connect the inserted Ethernet communication interface module
3 With a screwdriver, inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
4 2 holes for wall mounting
5 2 RJ45 interfaces with indication LEDs for connection with the Ethernet network
6 30 terminals for signals and process supply voltages (UP and UP3)
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

131.5.1 Ethernet network interface

Pin assignment

Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

131.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

132 TU508-ETH(-XC)

- TU508-ETH
- TU508-ETH-XC



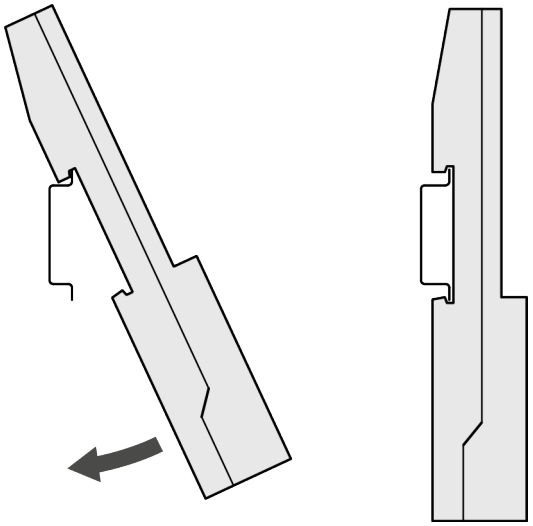
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Risk of injury and damaging the product!

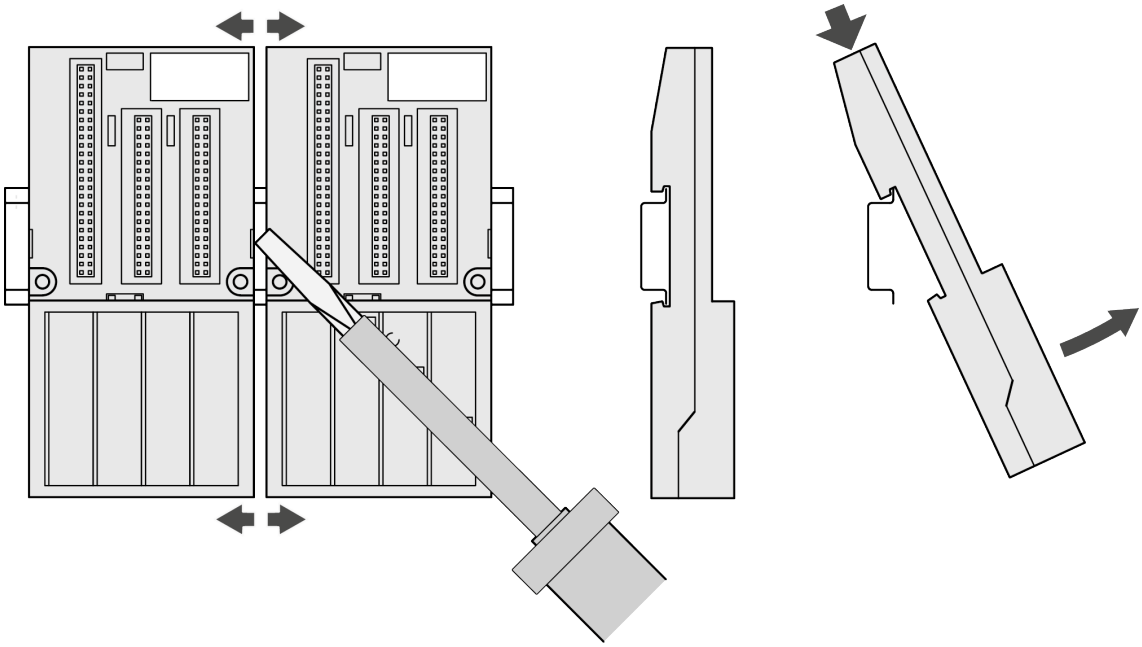
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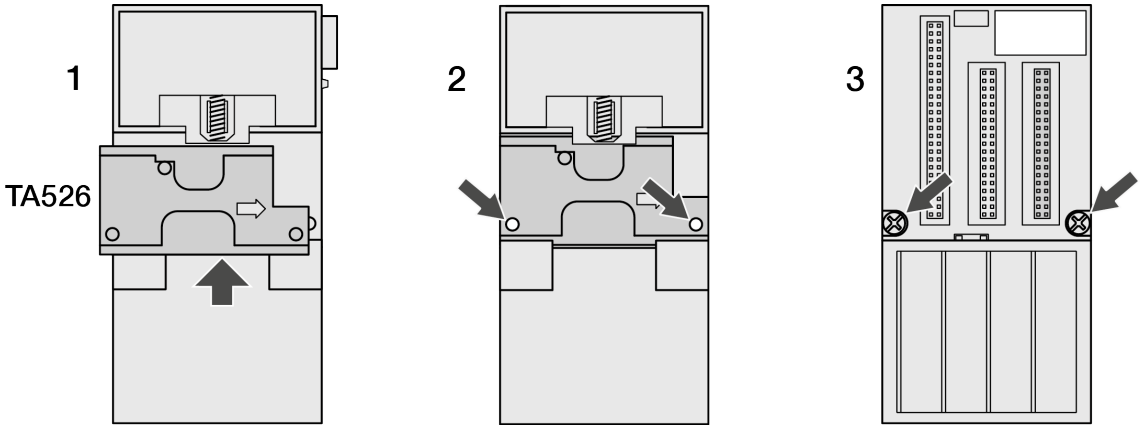
132.1 Assembly



132.2 Disassembly



132.3 Assembly with screws



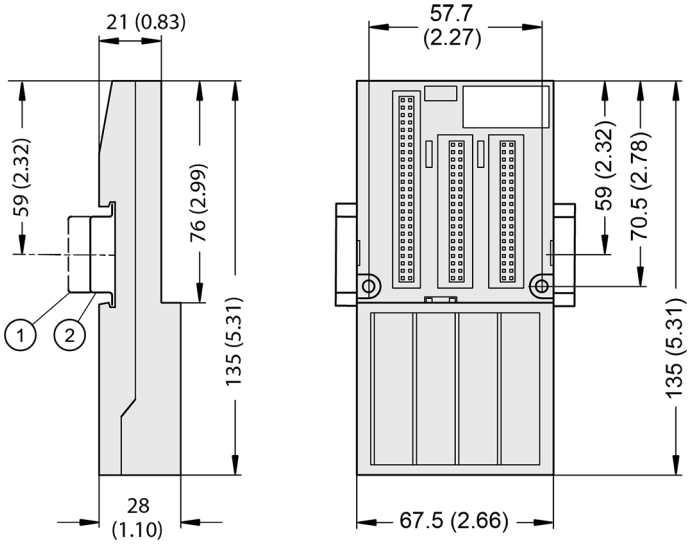
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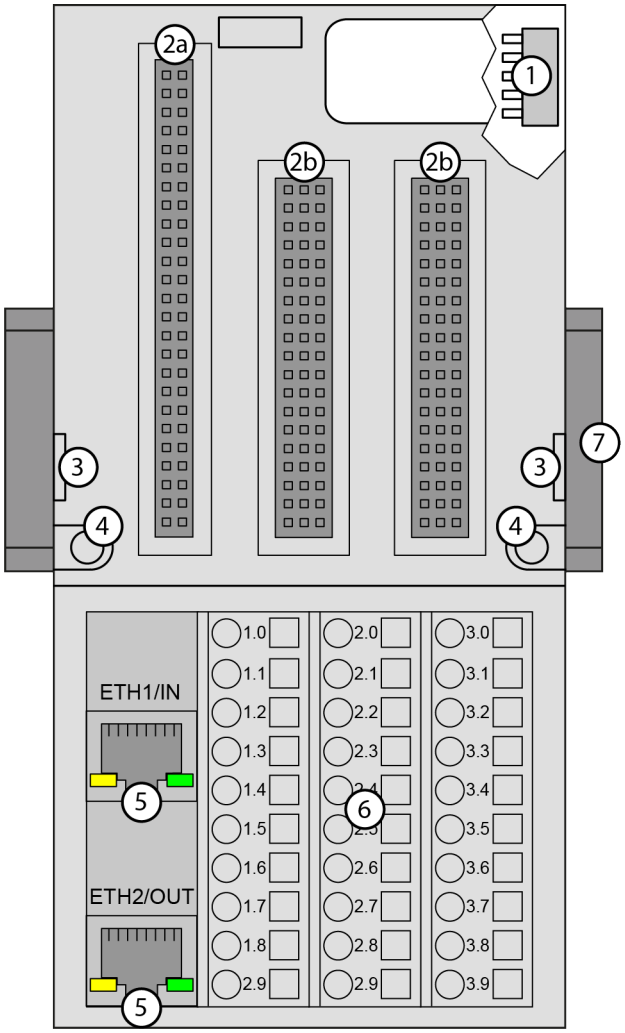
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132.5 Connections

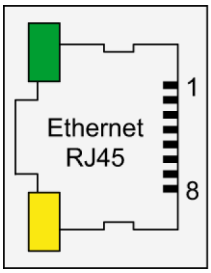


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132.5.1 Ethernet network interface

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	Shield	Cable shield	Functional earth

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Not supplied with this device.

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133 TU509

- TU509



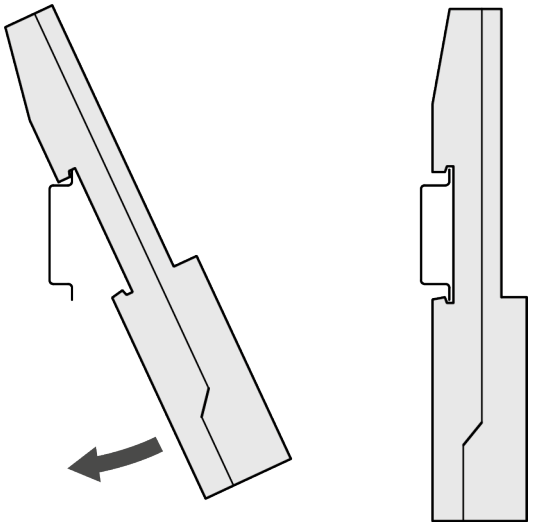
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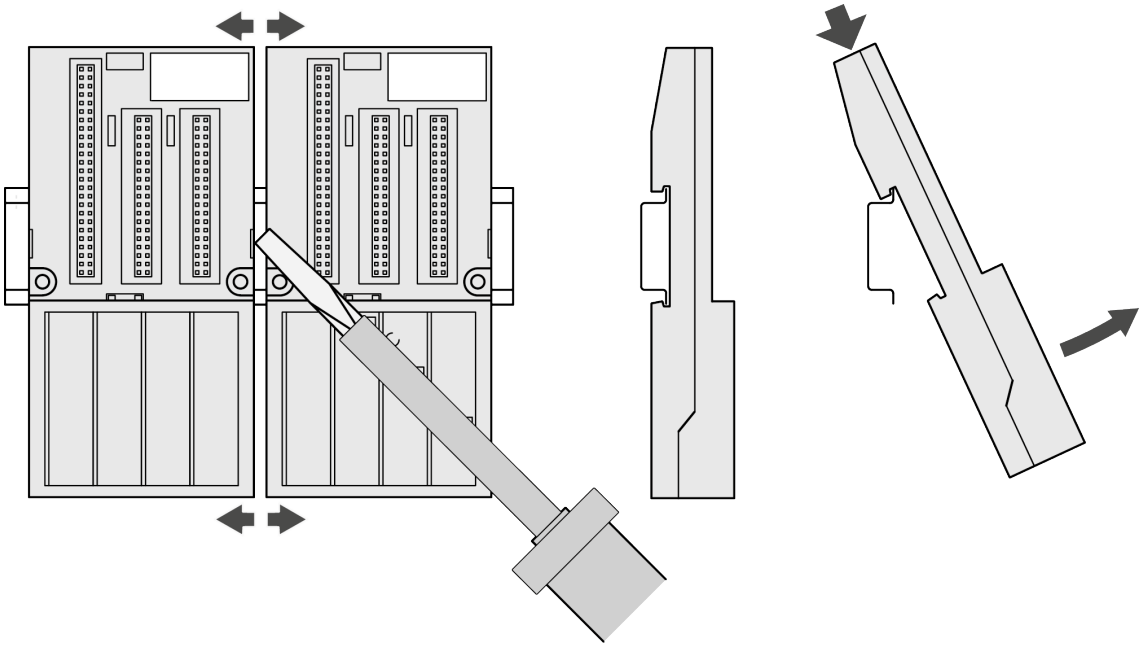
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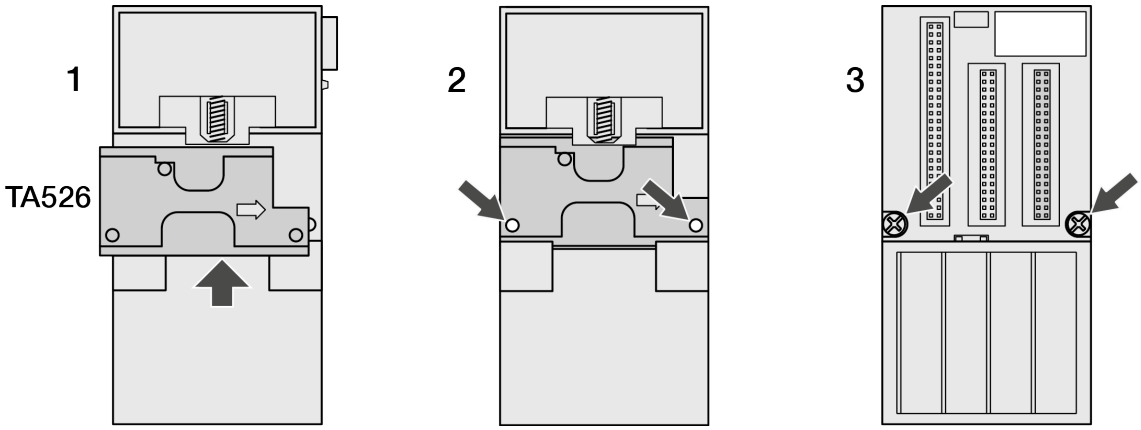
133.1 Assembly



133.2 Disassembly



133.3 Assembly with screws



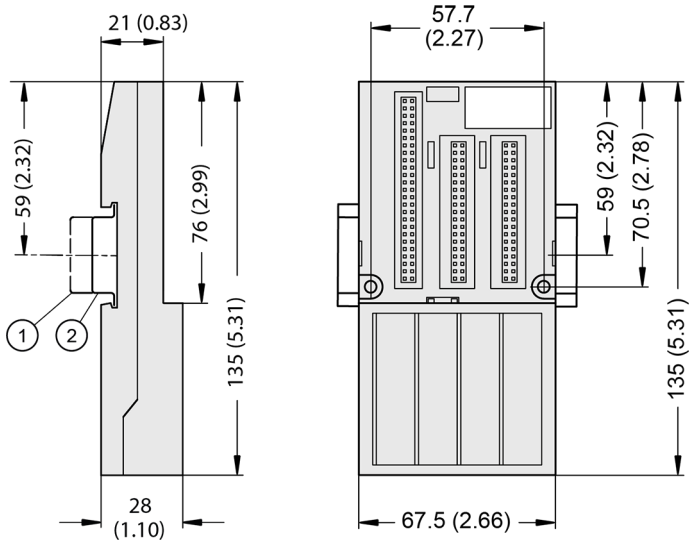
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

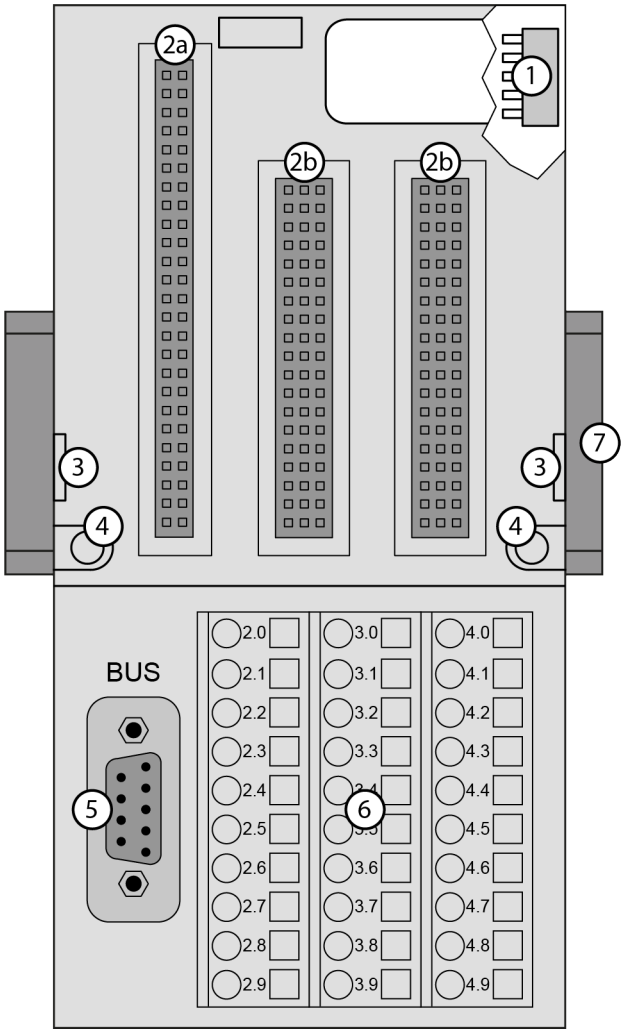
133.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

133.5 Connections

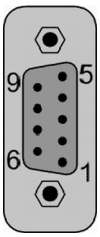


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2 25 pins) to connect the inserted communication interface module
2b Plug (3 19 pins) to connect the inserted communication interface module
3 With a screwdriver, inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
4 2 holes for wall mounting
5 D-sub 9 (female) for connection with the PROFIBUS network
6 30 terminals for signals and process supply voltages (UP and UP3)
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

133.5.1 Bus interface

Pin assignment

Interface	PIN	DP (PROFIBUS)	CN (CANopen)
	1	-	-
	2	-	CAN-
	3	B	CAN_GND
	4	-	-
	5	DGND	-
	6	VP (5V)	-
	7	-	CAN+
	8	A	-
	9	-	-

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

133.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

134 TU510(-XC)

- TU510
- TU510-XC



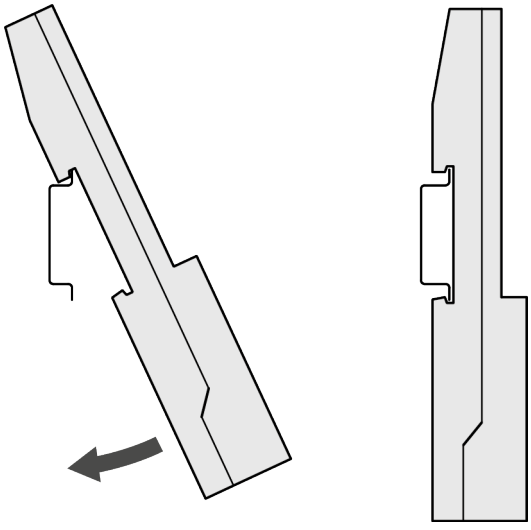
CAUTION!

Risk of injury and damaging the product!

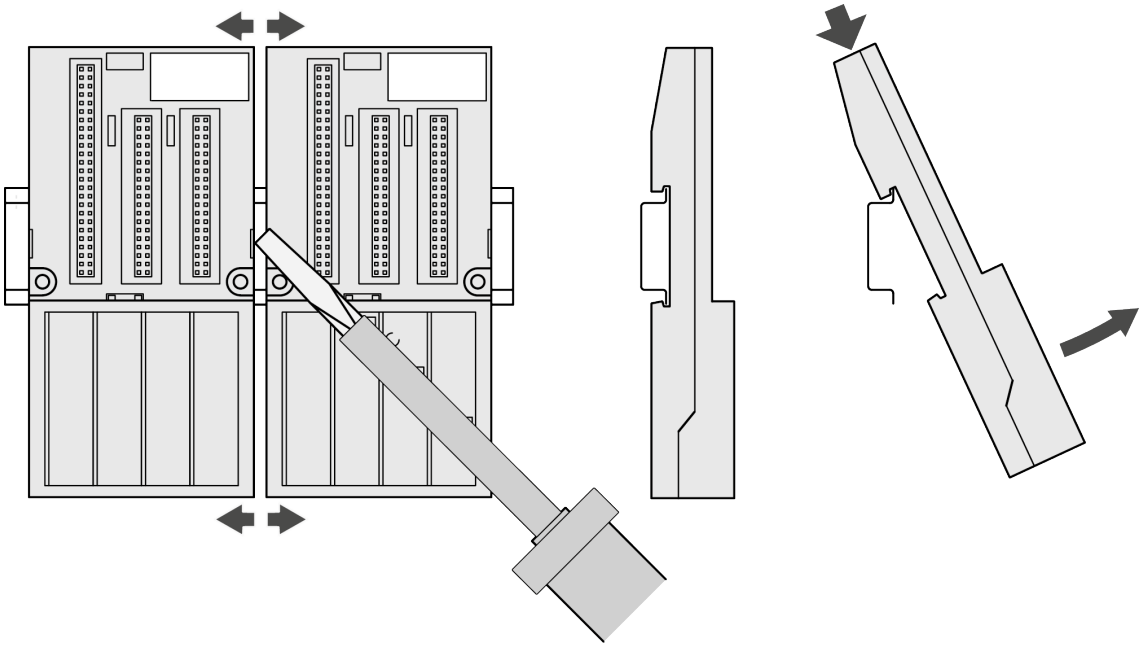
Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

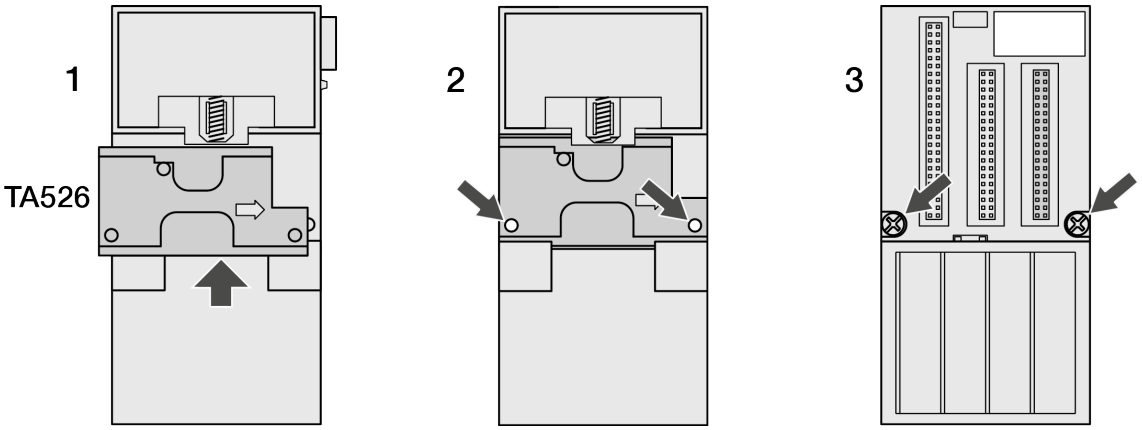
134.1 Assembly



134.2 Disassembly



134.3 Assembly with screws



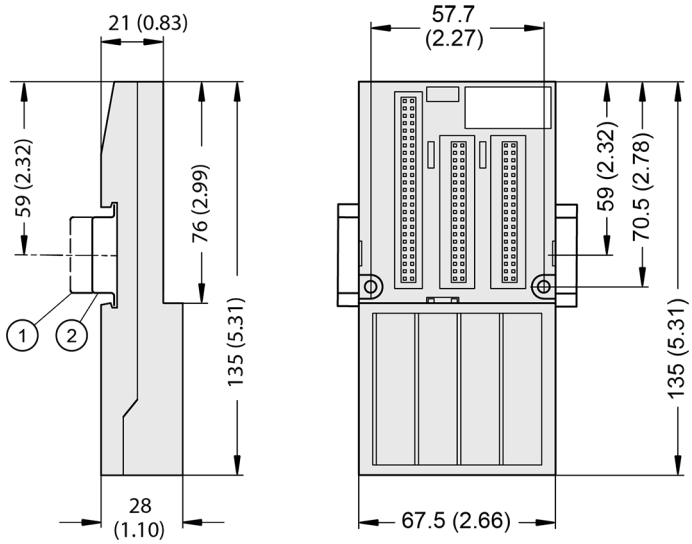
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

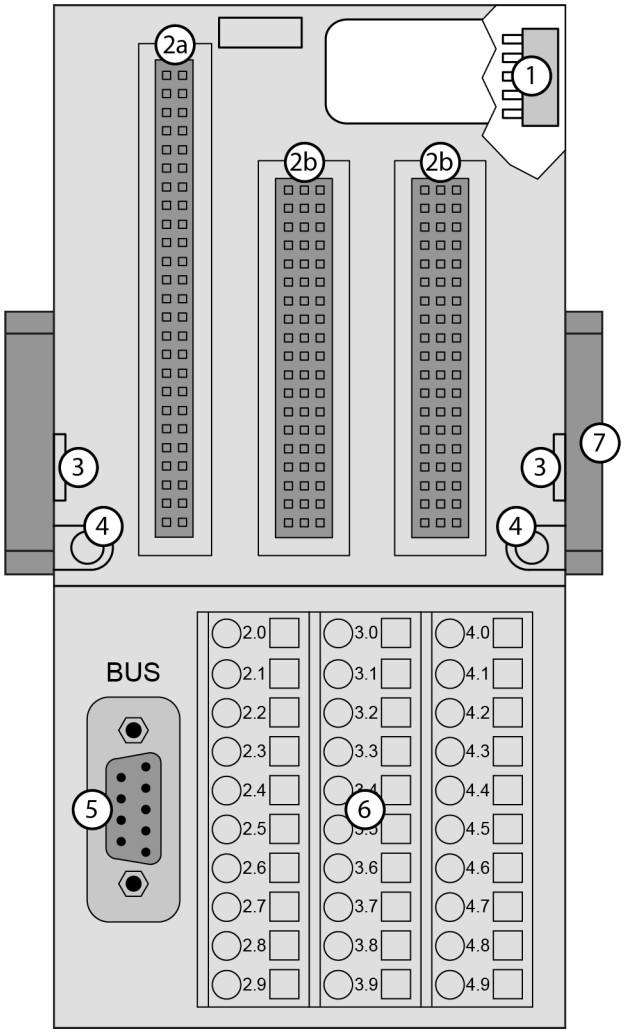
134.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

134.5 Connections

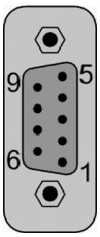


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2 25 pins) to connect the inserted communication interface module
2b Plug (3 19 pins) to connect the inserted communication interface module
3 With a screwdriver, inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
4 2 holes for wall mounting
5 D-sub 9 (female) for connection with the PROFIBUS network
6 30 terminals for signals and process supply voltages (UP and UP3)
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

134.5.1 Bus interface

Pin assignment

Interface	PIN	DP (PROFIBUS)	CN (CANopen)
	1		
	2		CAN-
	3	B	CAN_GND
	4		
	5	DGND	
	6	VP (5V)	
	7		CAN+
	8	A	
	9		

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

134.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

135 TU515 24 V DC

- TU515 24 V DC



CAUTION!

Risk of injury and damaging the product!

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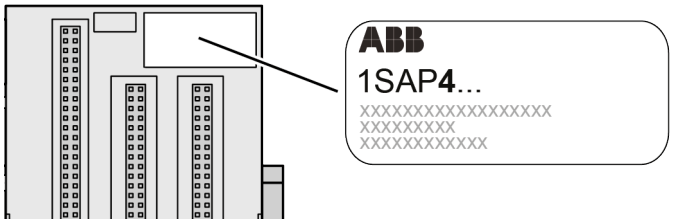
NOTICE!

Hot swap

Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

XC version **XC** = e**X**treme **C**onditions

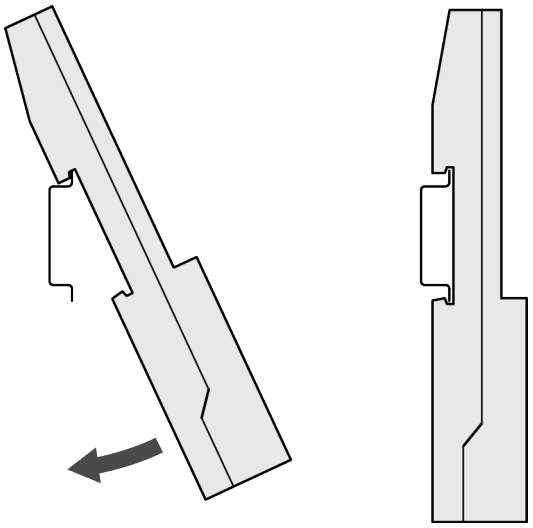


Extreme conditions

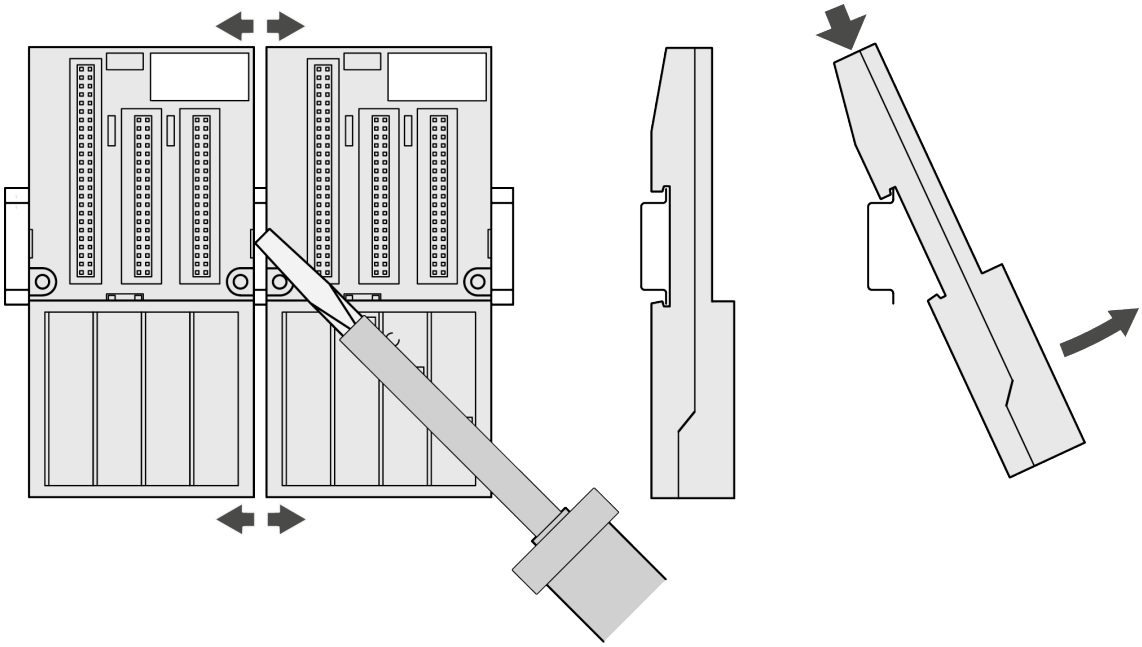
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

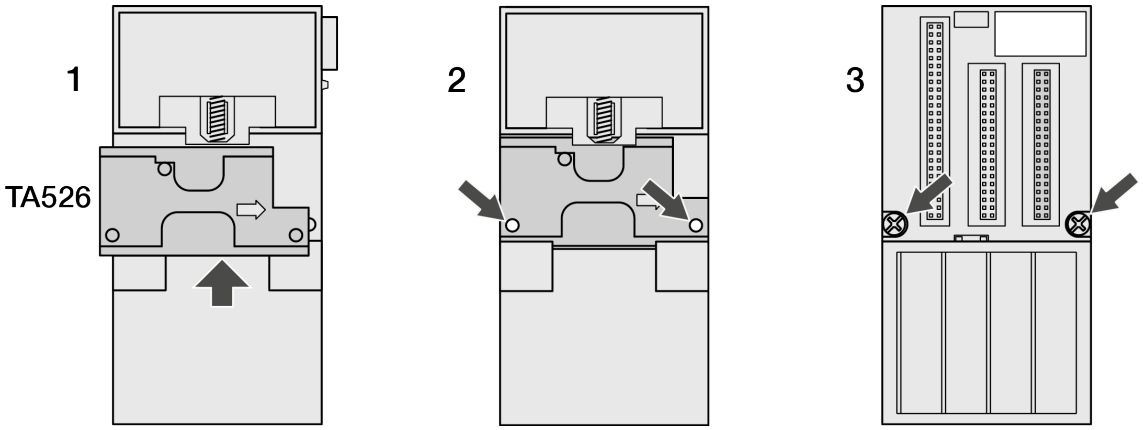
135.1 Assembly



135.2 Disassembly



135.3 Assembly with screws



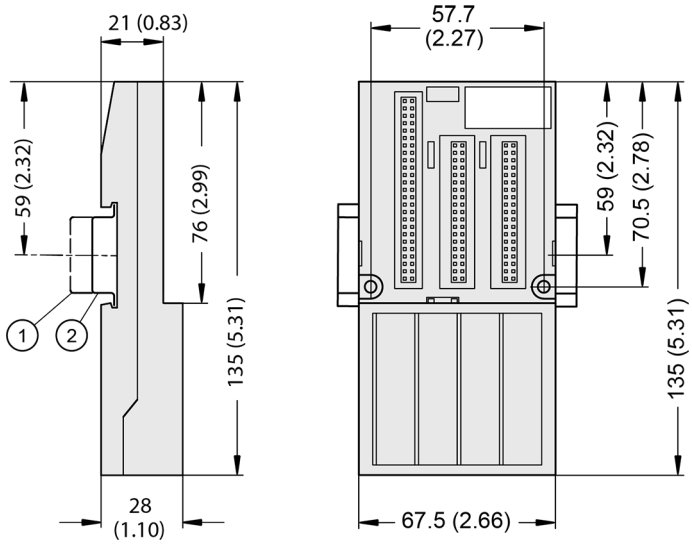
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1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

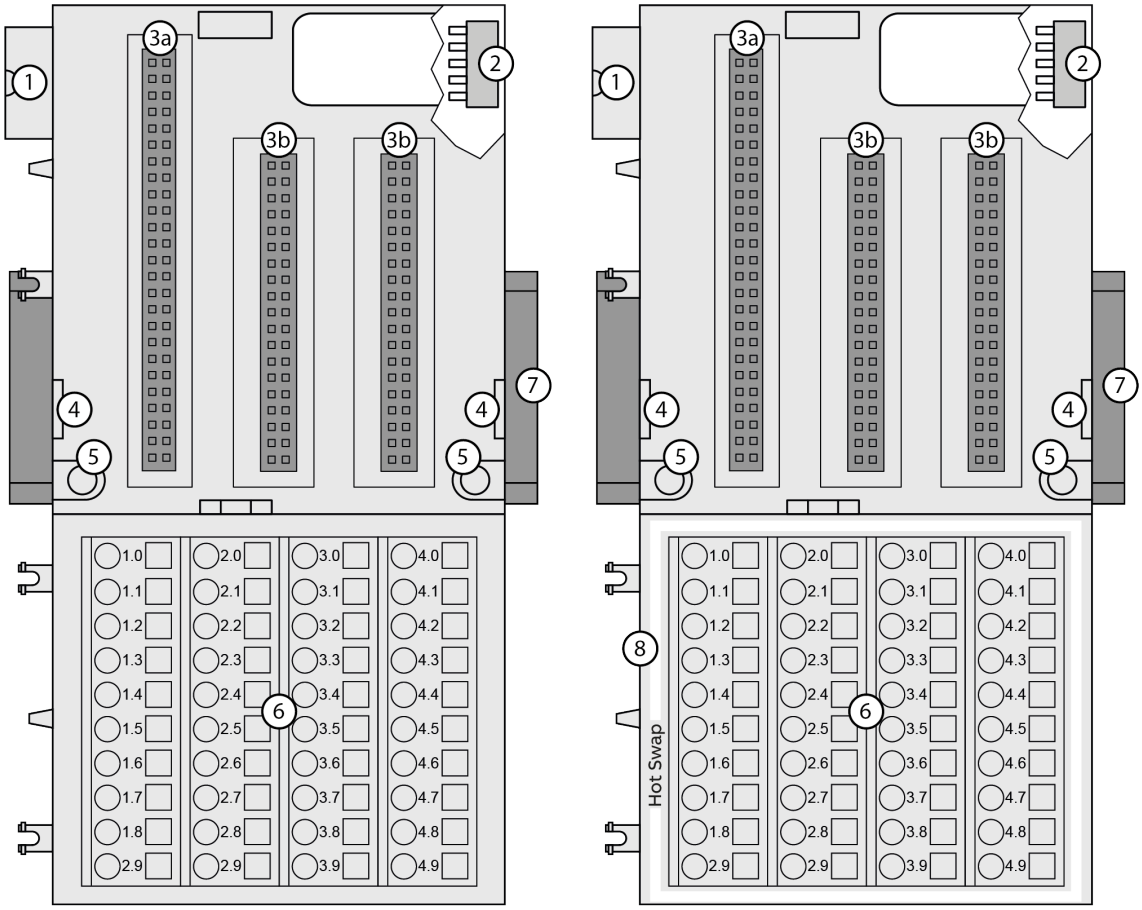
135.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

135.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3a Plug (2 x 25 pins) to connect the inserted I/O modules
3b Plug (2 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

135.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

136 TU516(-H)(-XC) 24 V DC

- TU516 24 V DC
- TU516-XC 24 V DC
- TU516-H 24 V DC
- TU516-H-XC 24 V DC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

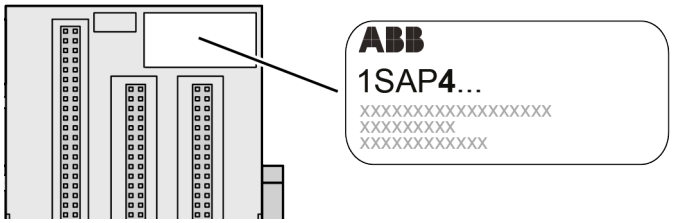
NOTICE!

Hot swap

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↳ *Chapter 4 “PLC System” on page 32*

XC version **XC** = e**X**treme **C**onditions

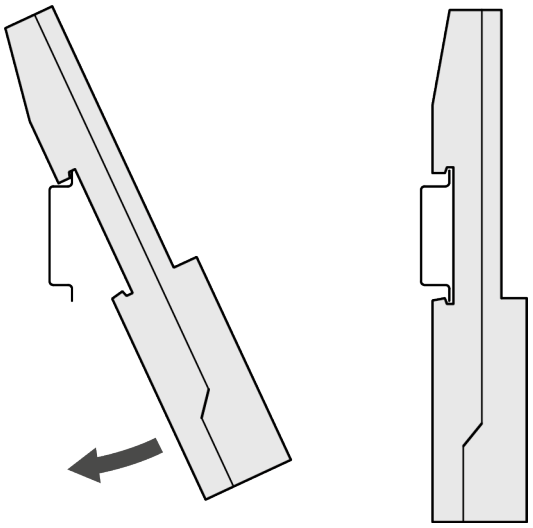


Extreme conditions

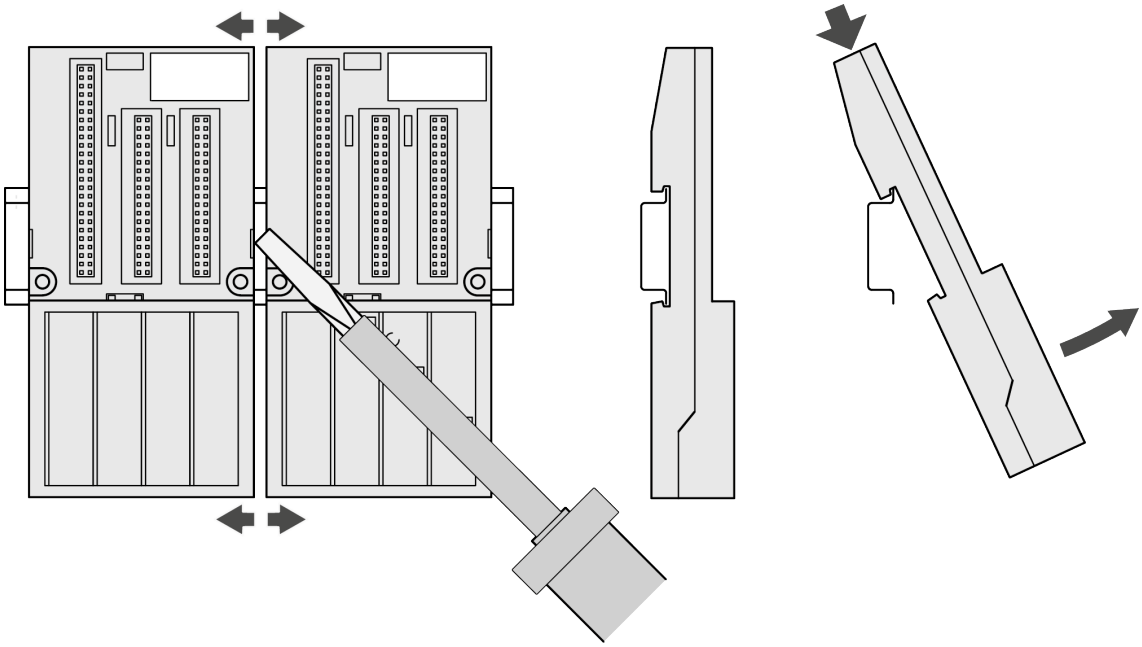
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

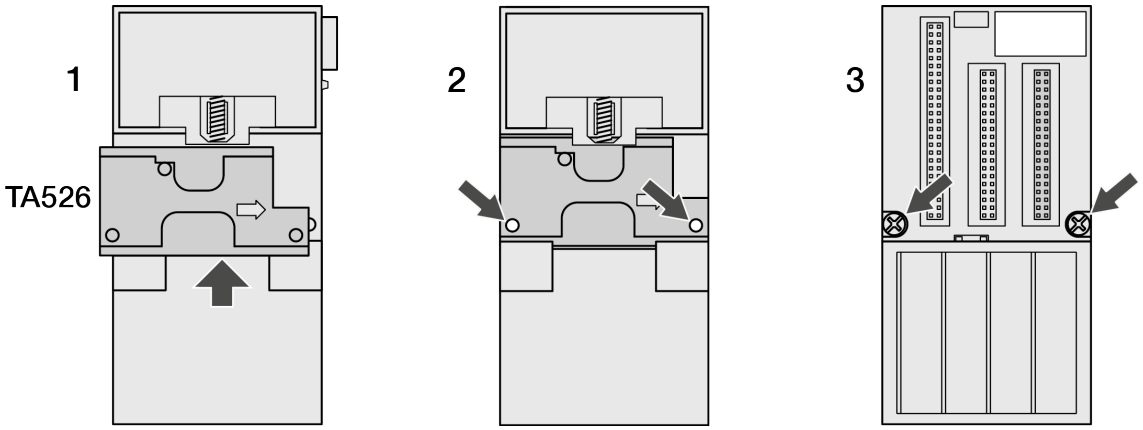
136.1 Assembly



136.2 Disassembly



136.3 Assembly with screws



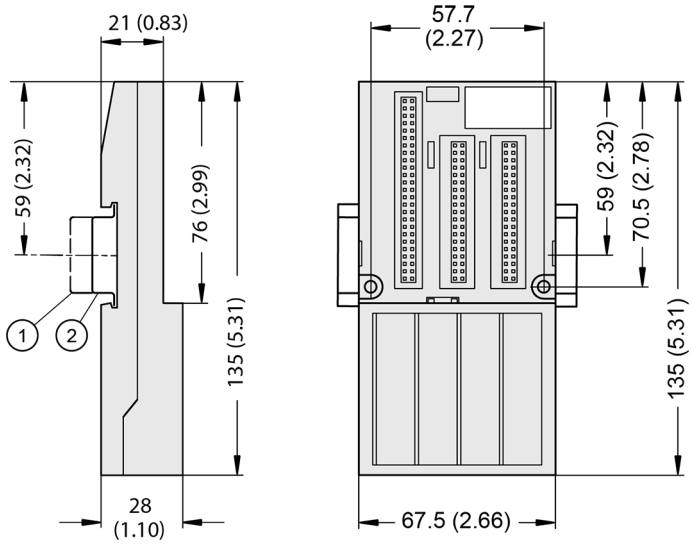
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

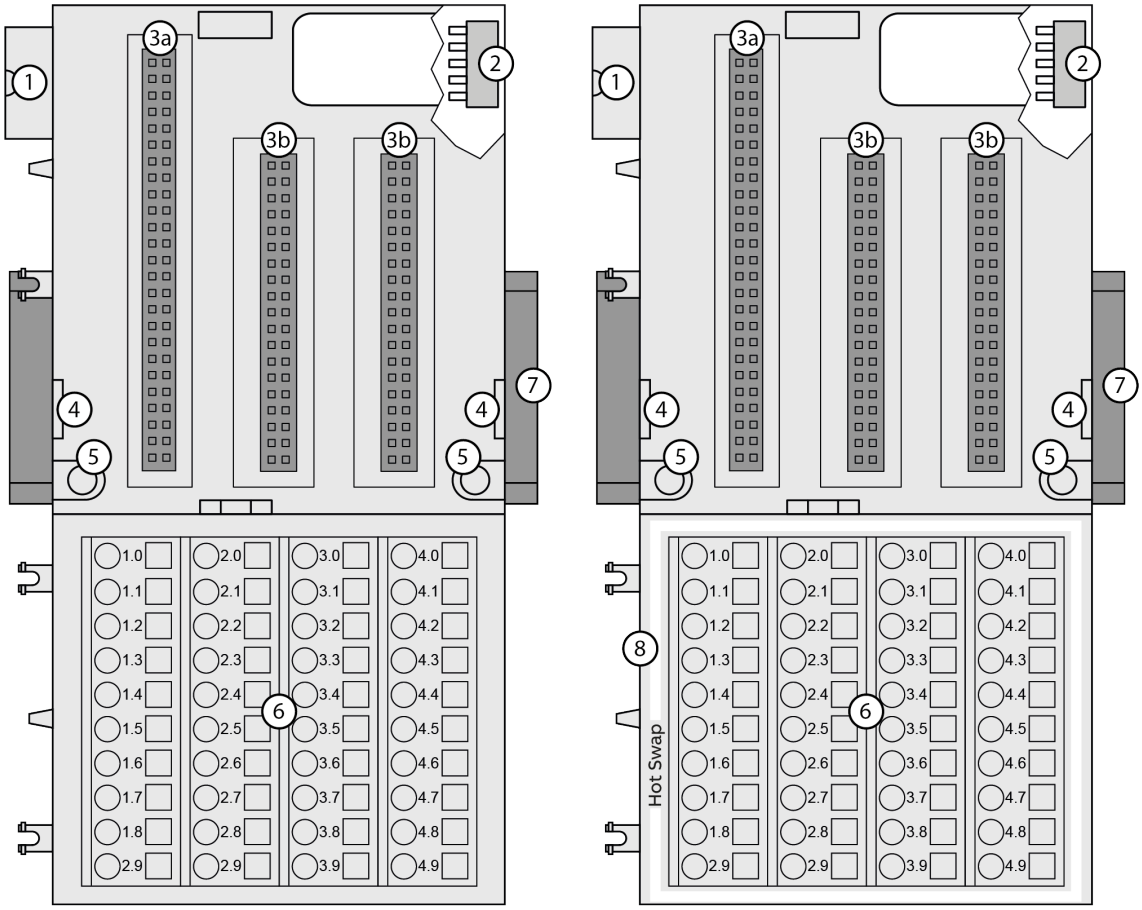
136.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

136.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3a Plug (2 x 25 pins) to connect the inserted I/O modules
3b Plug (2 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

136.6 Wiring

Proper wires and tools Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

137 TU517

- TU517



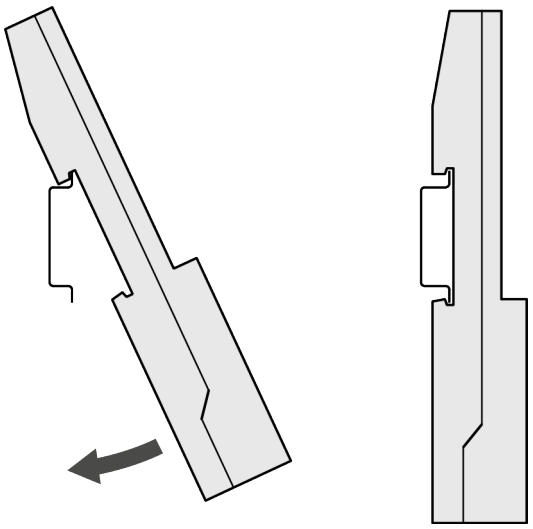
CAUTION!

Risk of injury and damaging the product!

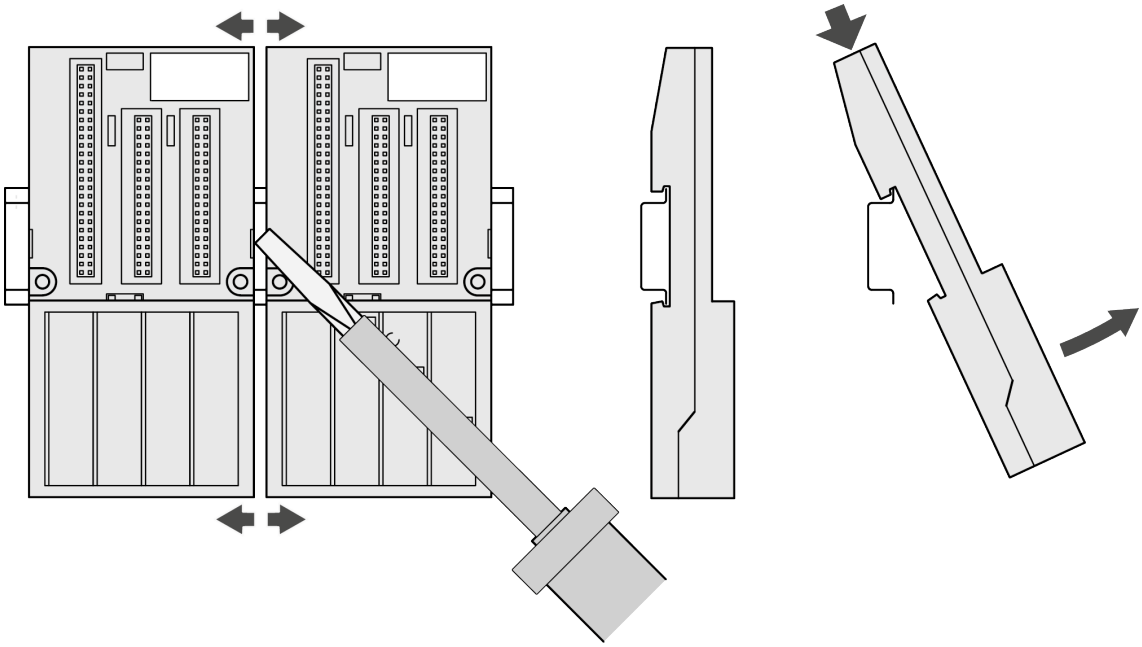
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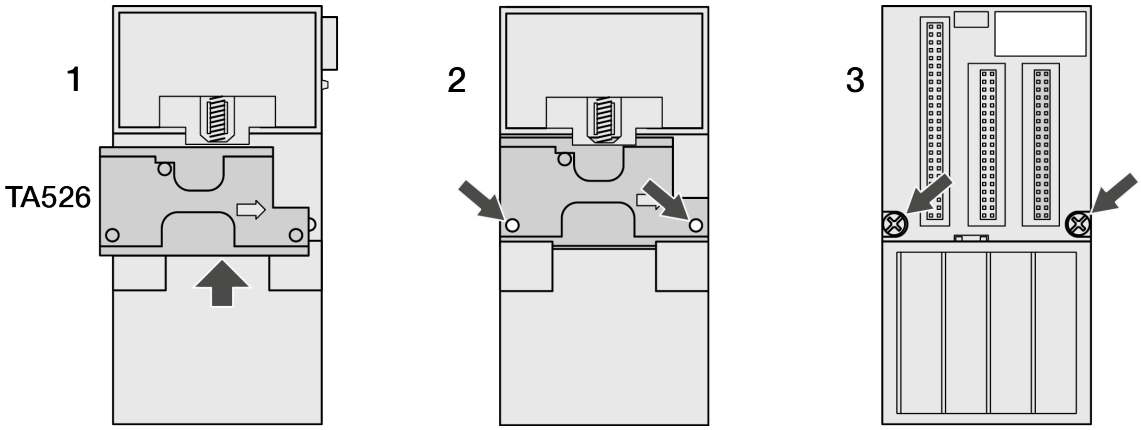
137.1 Assembly



137.2 Disassembly



137.3 Assembly with screws



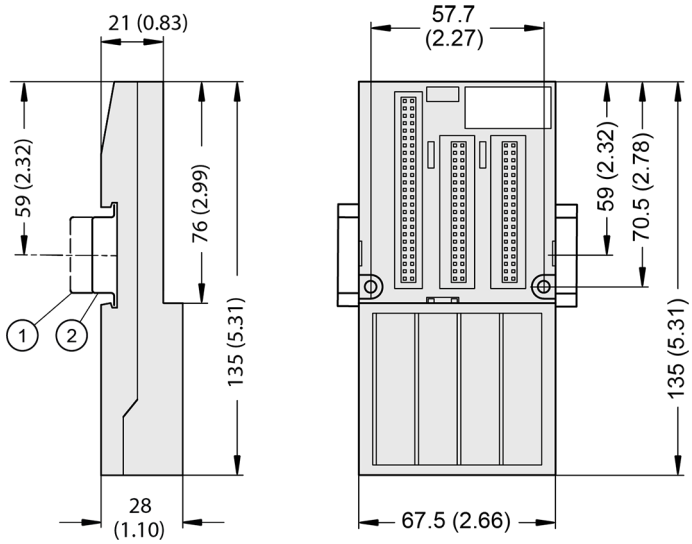
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2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

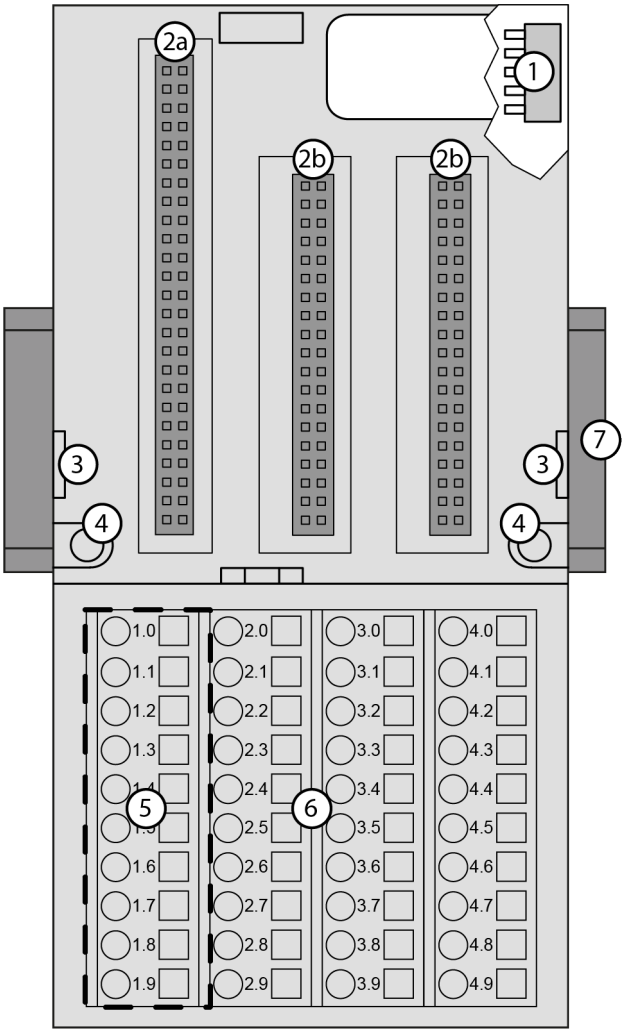
137.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

137.5 Connections

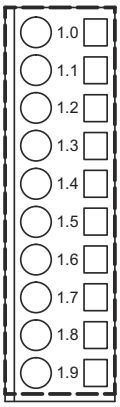


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2 25 pins) to connect the inserted communication interface module
2b Plug (2 19 pins) to connect the inserted communication interface module
3 With a screwdriver, inserted in this place, the terminal unit and the adjacent I/O terminal unit can be shoved from each other
4 2 holes for wall mounting
5 10 terminals for connection with the bus system
6 30 terminals for signals and process supply voltages (UP and UP3)
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

137.5.1 Bus interface

Pin assignment

Interface	PIN	DP (PROFIBUS)	CN (CANopen)
	1.0	B	CAN+
	1.1	B	CAN+
	1.2	A	CAN-
	1.3	A	CAN-
	1.4	TermB	Term+
	1.5	TermB	Term+
	1.6	TermA	Term-
	1.7	TermA	Term-
	1.8	DGND	CAN_GND
	1.9	DGND	CAN_GND

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

137.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

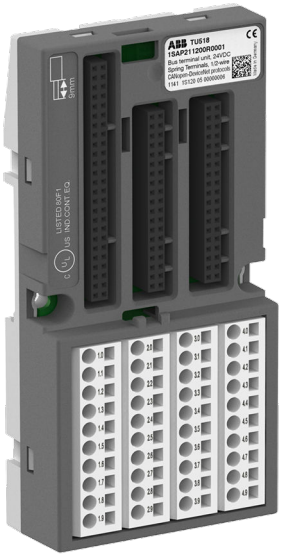
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
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138 TU518(-XC)

- TU518
- TU518-XC



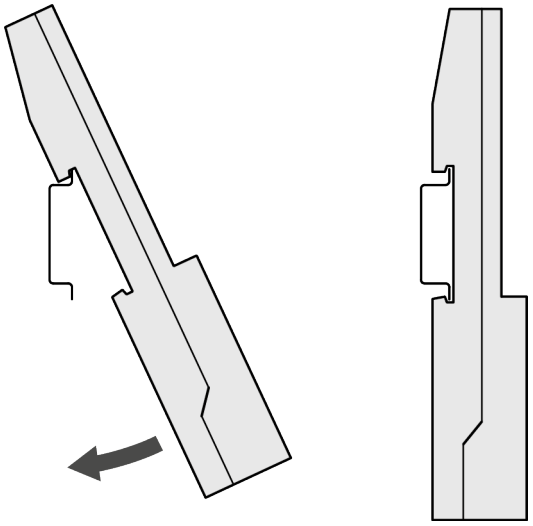
CAUTION!

Risk of injury and damaging the product!

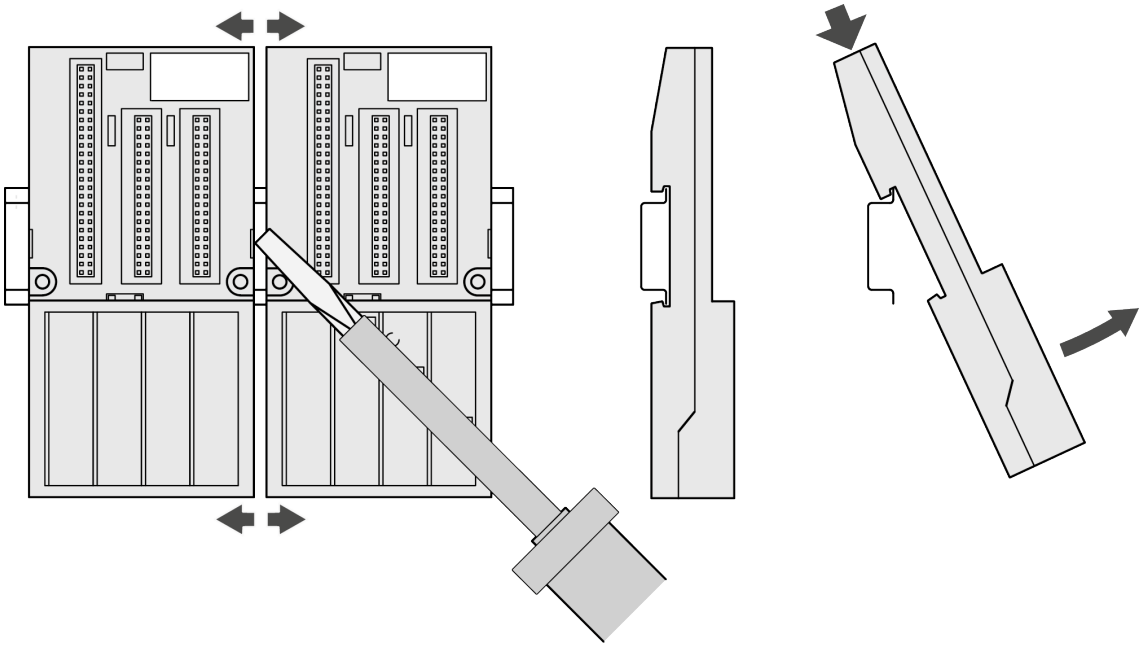
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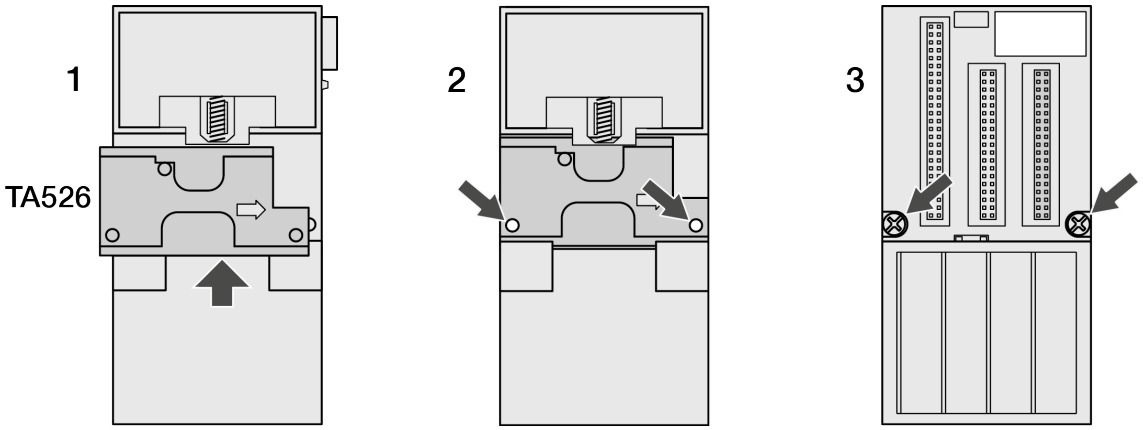
138.1 Assembly



138.2 Disassembly



138.3 Assembly with screws



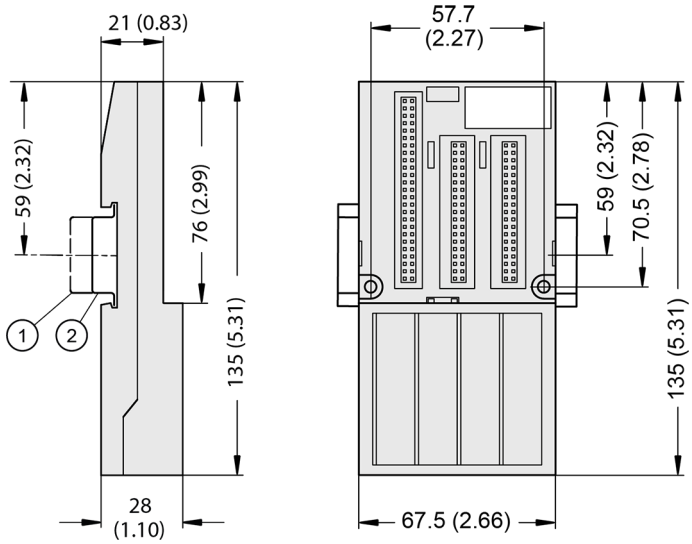
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For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

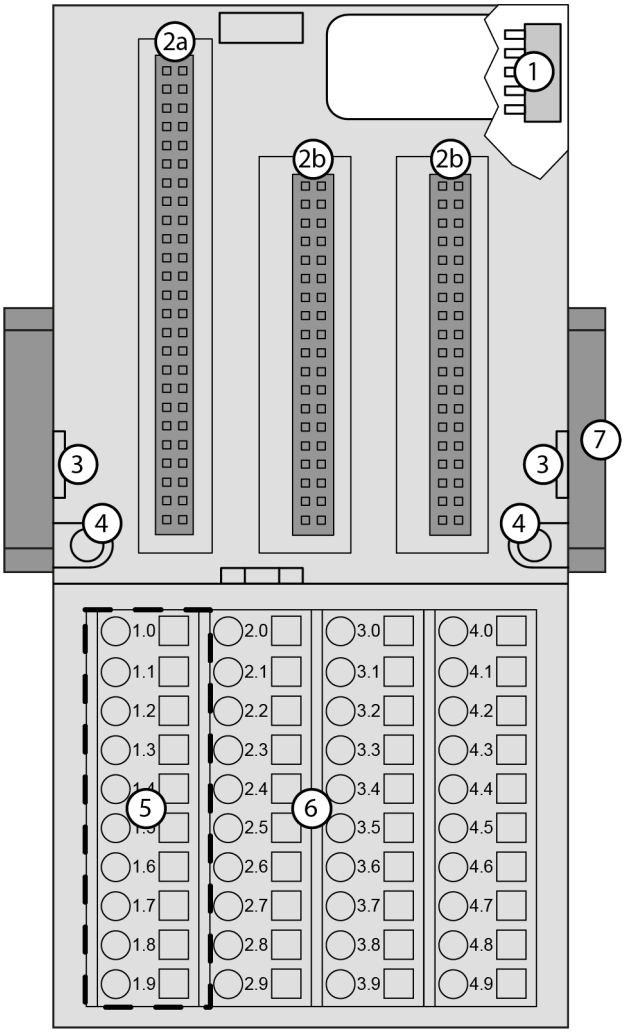
138.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

138.5 Connections

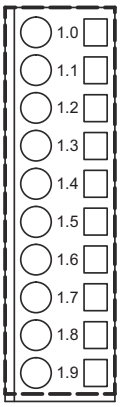


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2 25 pins) to connect the inserted communication interface module
2b Plug (2 19 pins) to connect the inserted communication interface module
3 With a screwdriver, inserted in this place, the terminal unit and the adjacent I/O terminal unit can be shoved from each other
4 2 holes for wall mounting
5 10 terminals for connection with the bus system
6 30 terminals for signals and process supply voltages (UP and UP3)
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

138.5.1 Bus interface

Pin assignment

Interface	PIN	DP (PROFIBUS)	CN (CANopen)
	1.0	B	CAN+
	1.1	B	CAN+
	1.2	A	CAN-
	1.3	A	CAN-
	1.4	TermB	Term+
	1.5	TermB	Term+
	1.6	TermA	Term-
	1.7	TermA	Term-
	1.8	DGND	CAN_GND
	1.9	DGND	CAN_GND

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

138.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

139 TU520-ETH(-XC)

- TU520-ETH
- TU520-ETH-XC



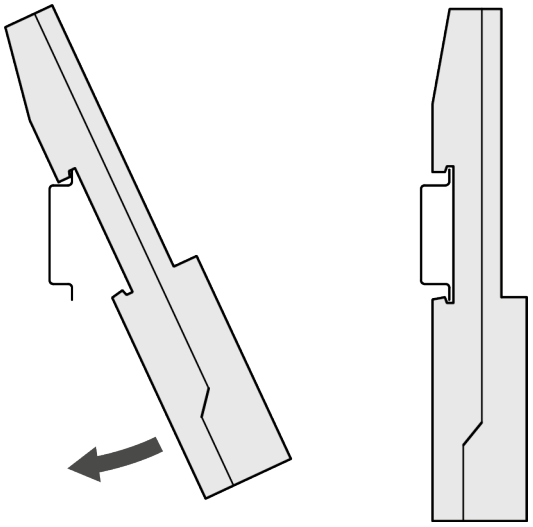
CAUTION!

Risk of injury and damaging the product!

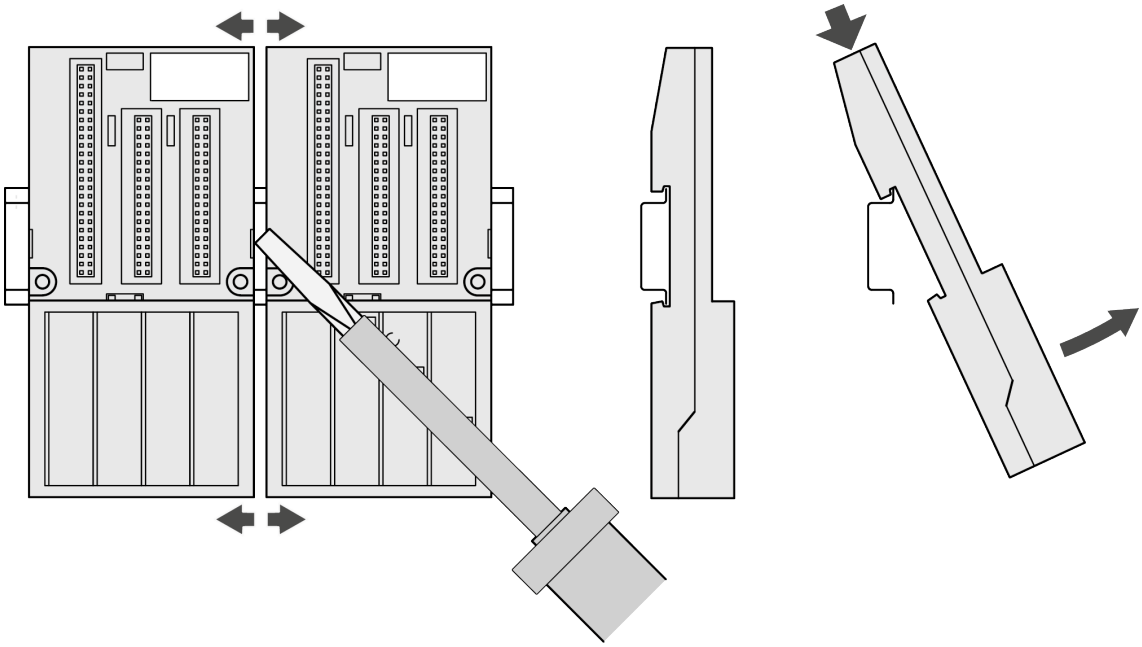
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

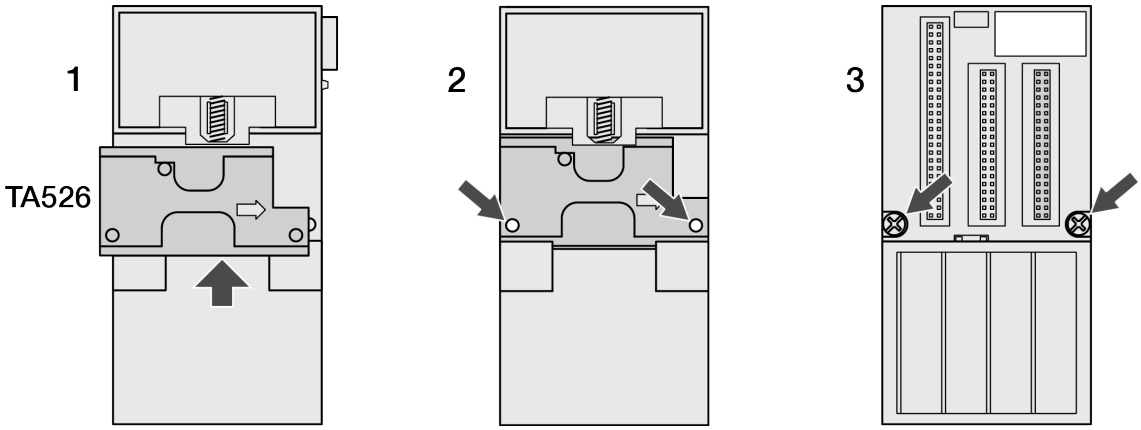
139.1 Assembly



139.2 Disassembly



139.3 Assembly with screws



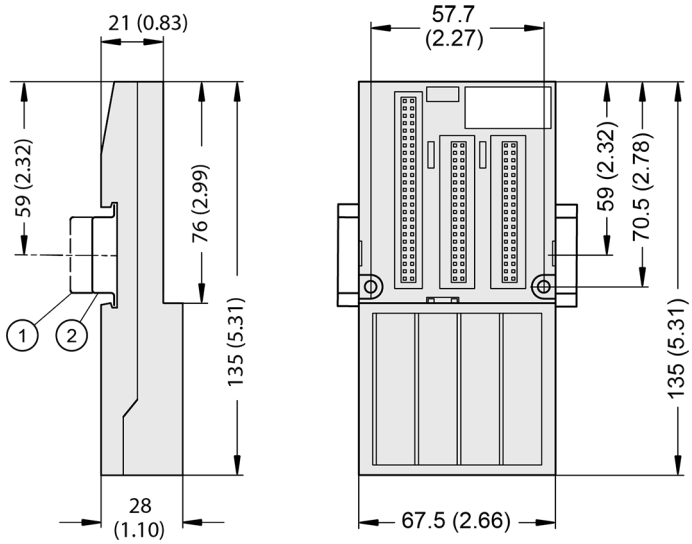
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

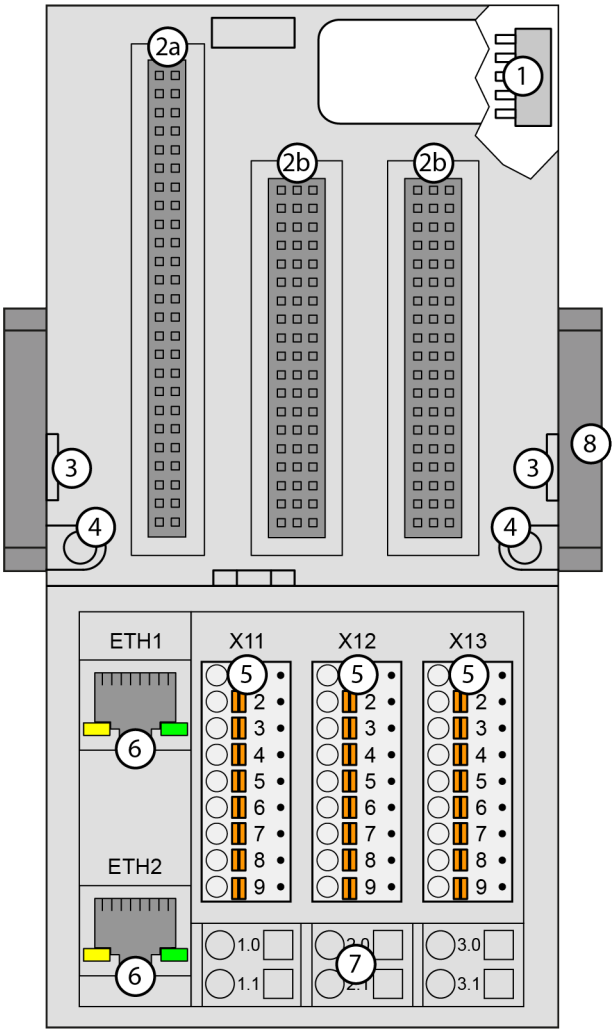
139.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

139.5 Connections

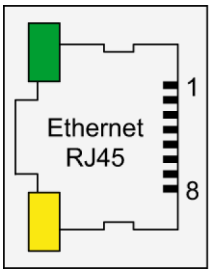


1 I/O bus (10 pins, female) to connect the first terminal unit
2a Plug (2 25 pins) to connect the inserted PROFINET communication interface module
2b Plug (3 19 pins) to connect the inserted PROFINET communication interface module
3 With a screwdriver, inserted in this place, the PROFINET I/O terminal unit and the adjacent I/O terminal unit can be shoved from each other
4 2 holes for wall mounting
5 3 removable connectors to connect the subordinated bus systems
6 2 RJ45 interfaces with indication LEDs for connection with the PROFINET network
7 6 spring terminals for process supply voltage (UP)
8 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

139.5.1 Ethernet network interface

Pin assignment

Interface	Pin	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NC	Not connected
	5	NC	Not connected
	6	RxD-	Receive data -
	7	NC	Not connected
	8	NC	Not connected
	Shield	Cable shield	Functional earth

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

139.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

140 TU531 230 V AC

- TU531 230 V AC



CAUTION!

Risk of injury and damaging the product!

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– Only by qualified personnel.

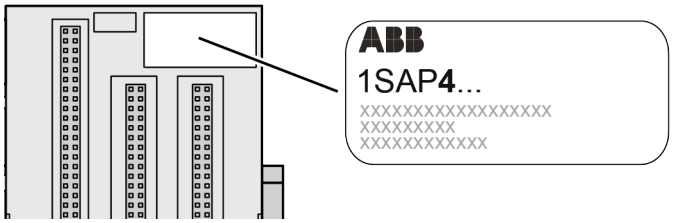
NOTICE!

Hot swap

Devices marked with a specific device index can be hot-swapped. Consider the given requirements and instructions before hot-swapping the devices to avoid damage to the PLC.

Chapter 4 “PLC System” on page 32

XC version **XC** = e**X**treme **C**onditions

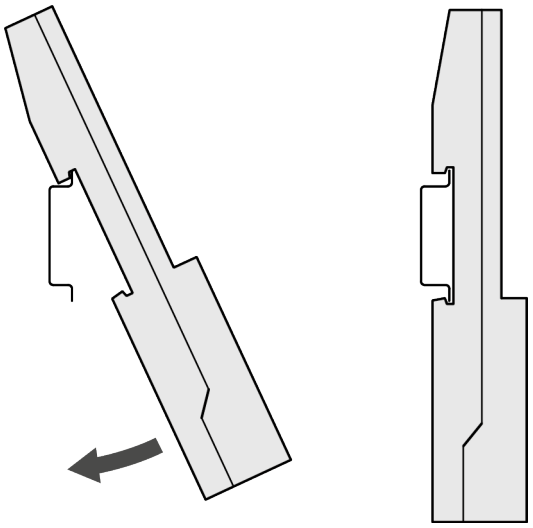


Extreme conditions

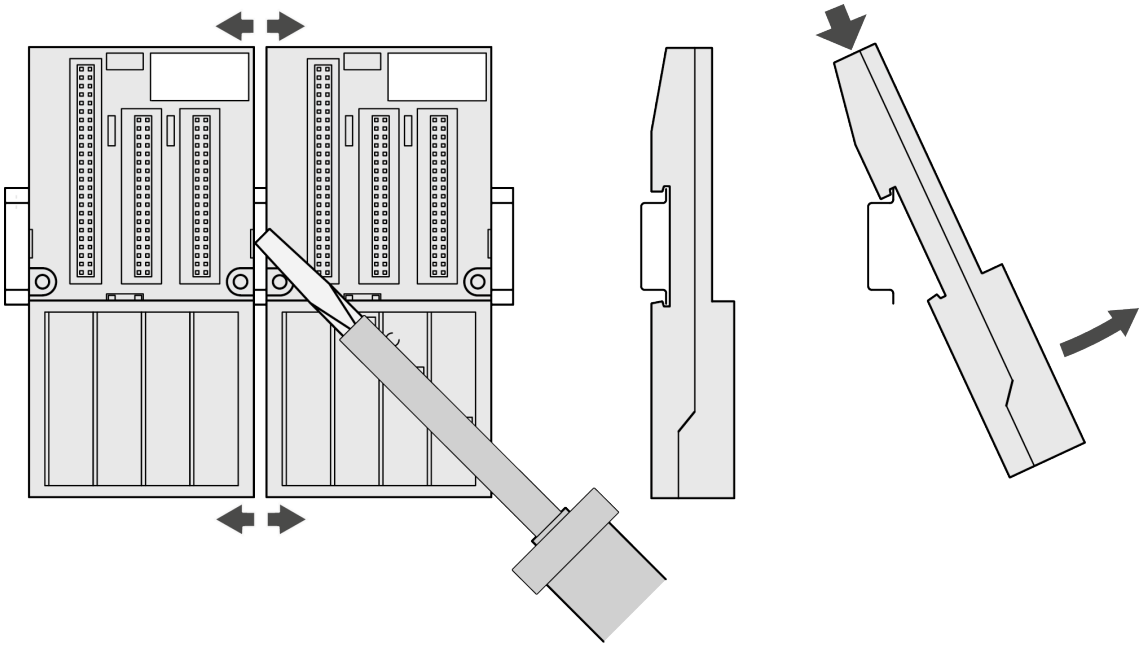
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

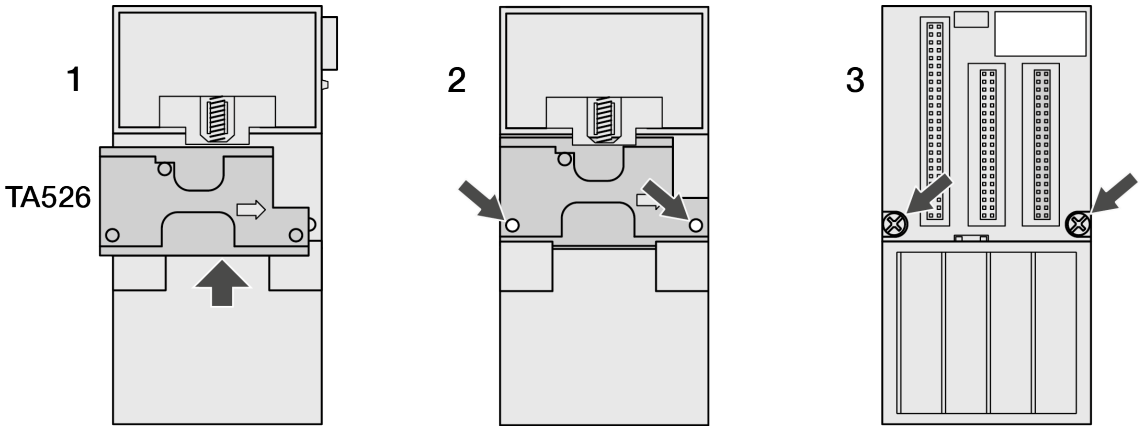
140.1 Assembly



140.2 Disassembly



140.3 Assembly with screws



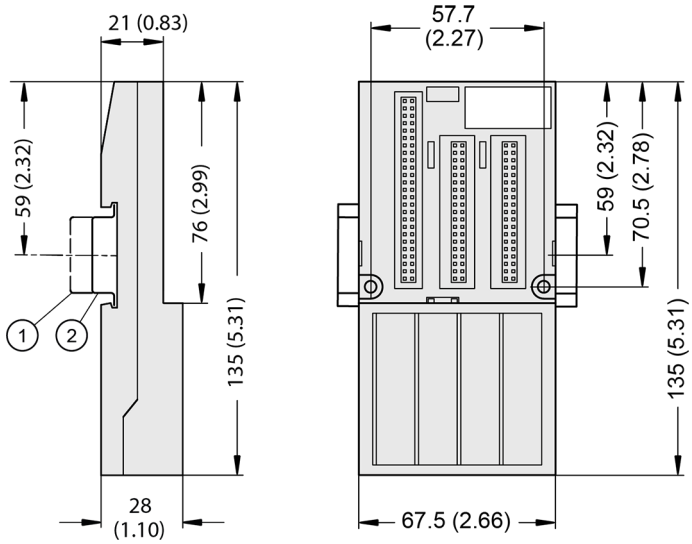
NOTICE!

Use screw mounting accessory to avoid damage!

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1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

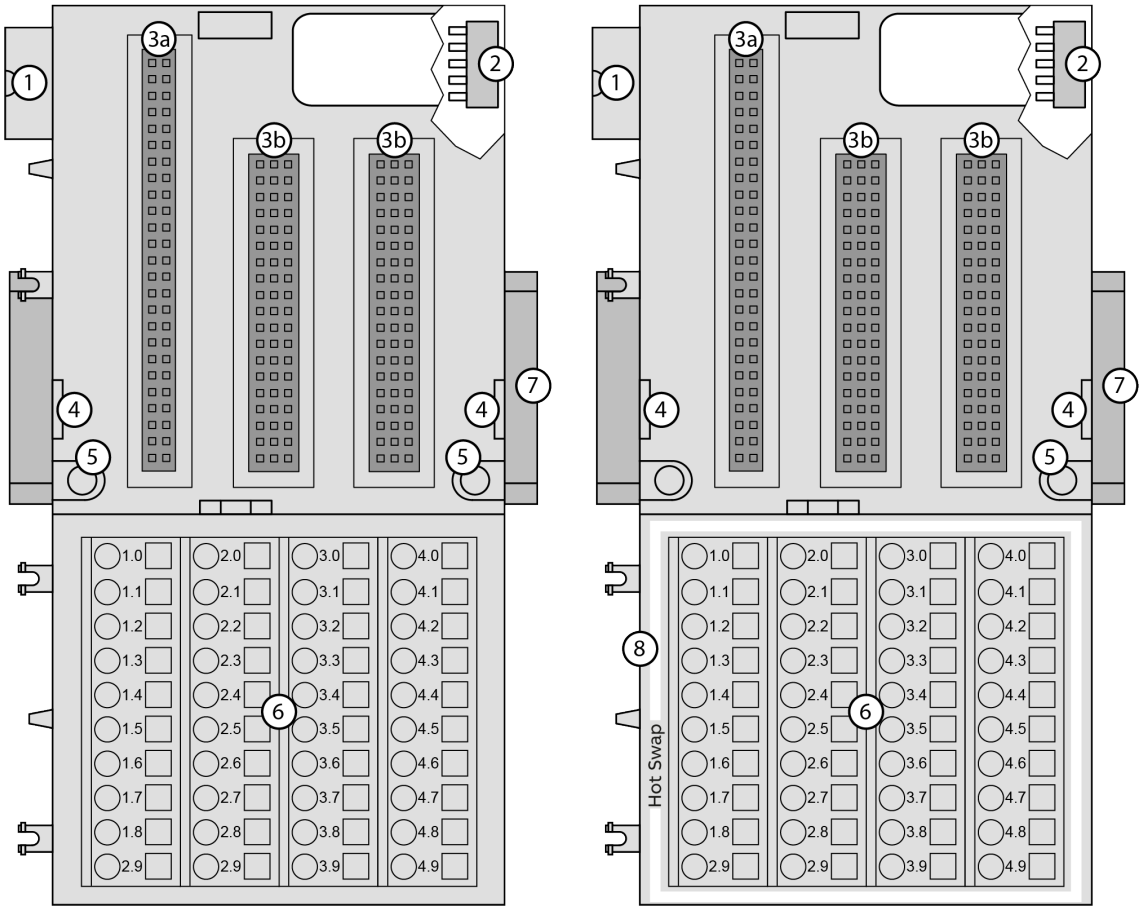
140.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

140.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3a Plug (2 x 25 pins) to connect the inserted I/O modules
3b Plug (3 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent I/O terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

NOTICE!

Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

140.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

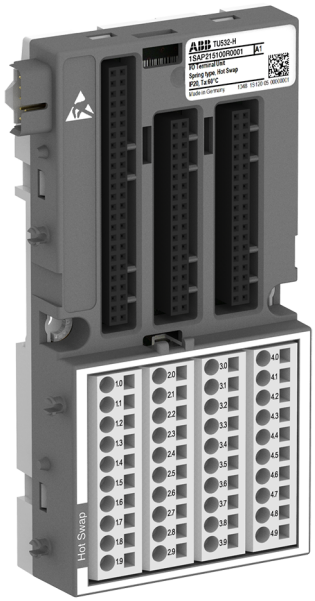
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

141 TU532(-H)(-XC) 230 V AC

- TU532 230 V AC
- TU532-XC 230 V AC
- TU532-H 230 V AC
- TU532-H-XC 230 V AC



CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

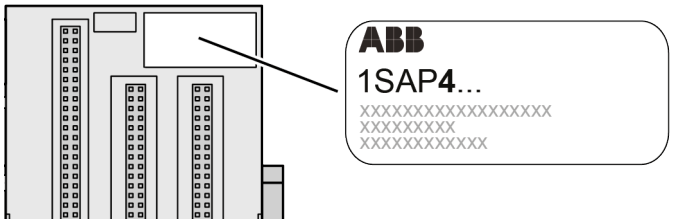
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Chapter 4 “PLC System” on page 32

XC version **XC** = e**X**treme **C**onditions

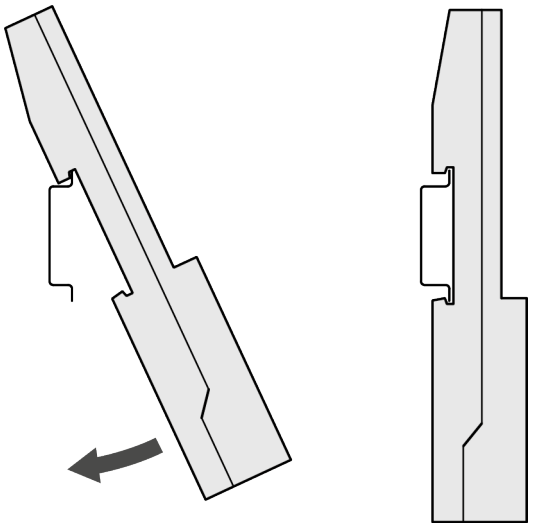


Extreme conditions

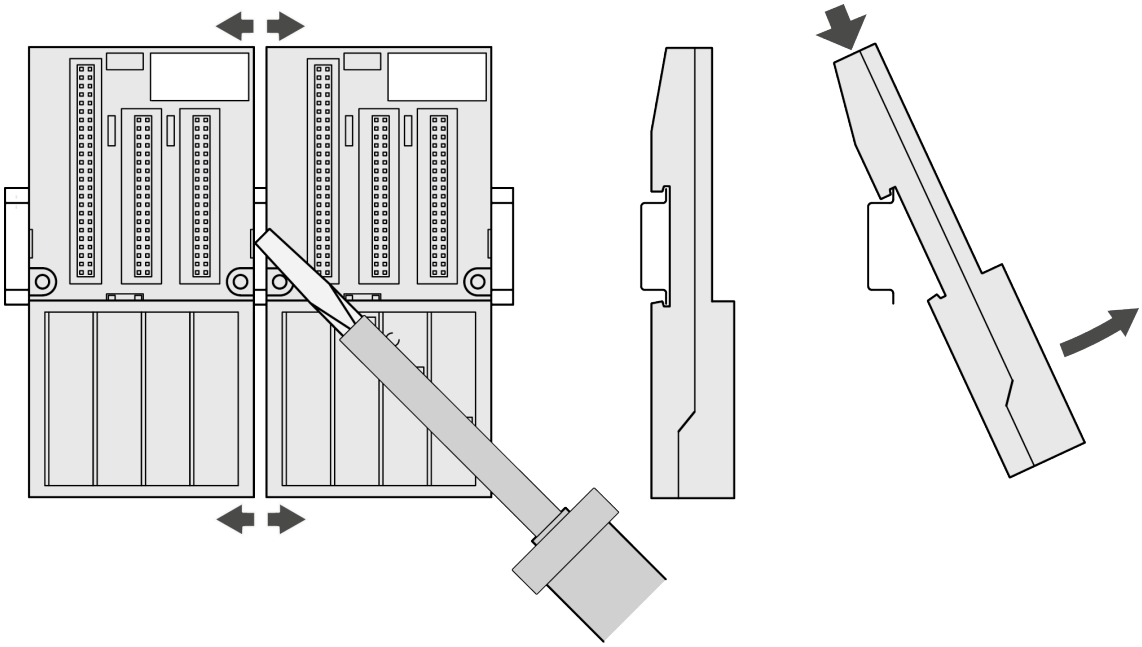
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

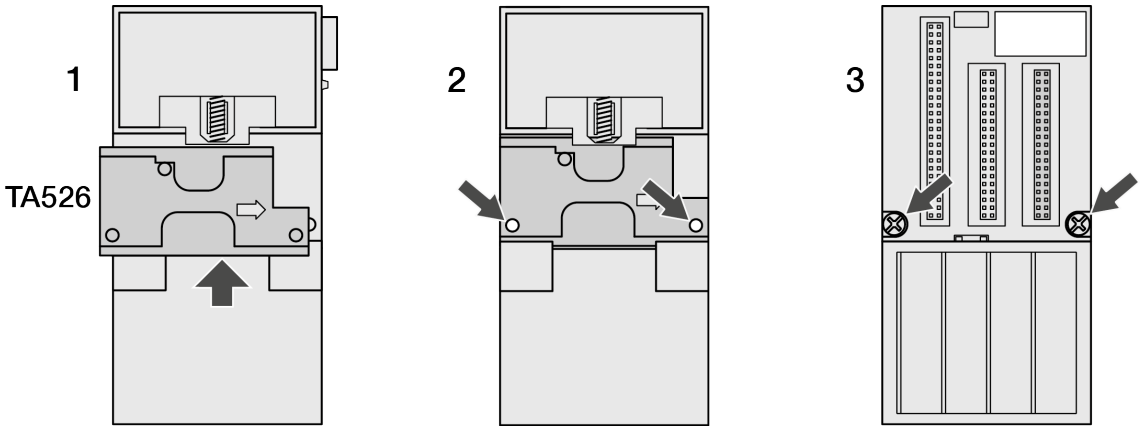
141.1 Assembly



141.2 Disassembly



141.3 Assembly with screws



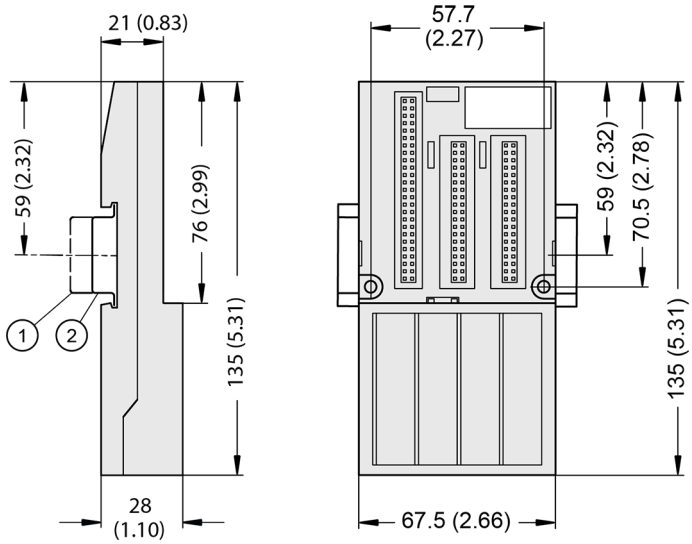
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

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2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

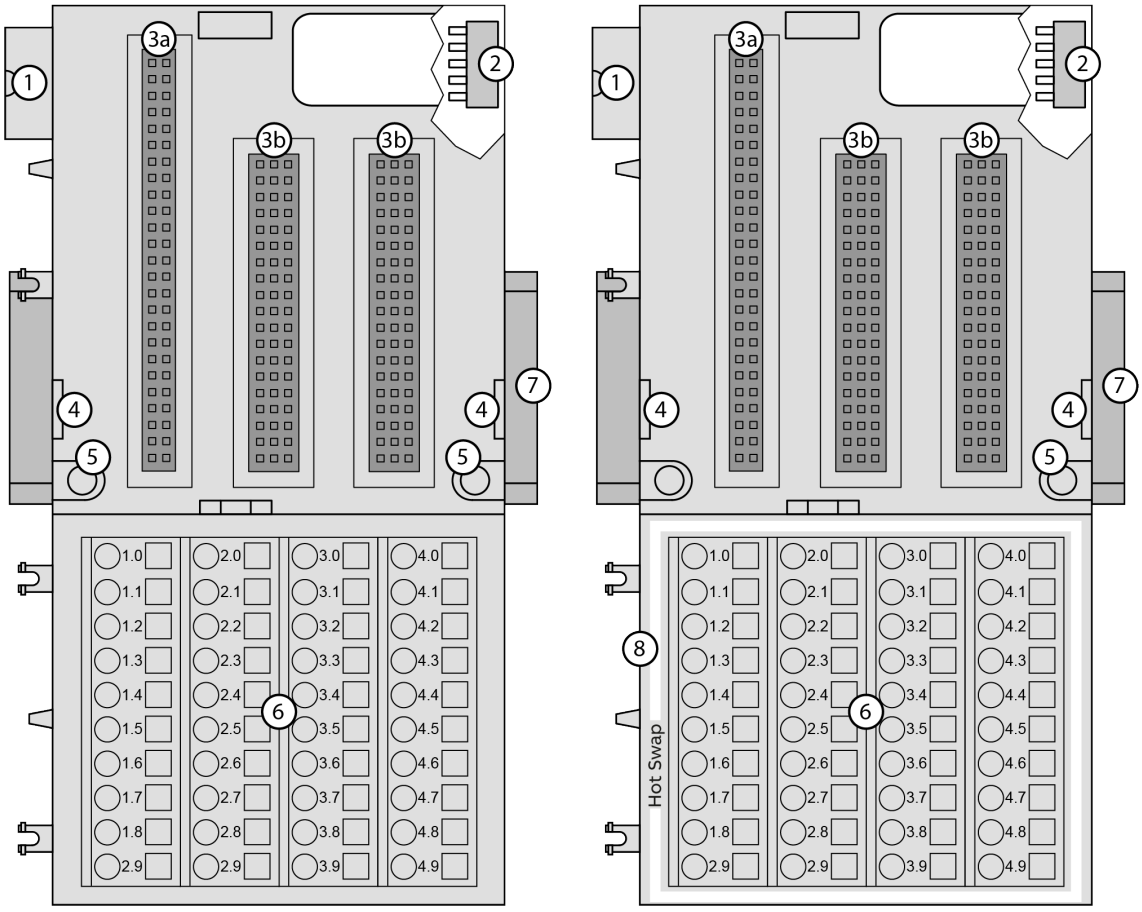
141.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

141.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3a Plug (2 x 25 pins) to connect the inserted I/O modules
3b Plug (3 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent I/O terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

NOTICE!

Risk of damaging low voltage devices

Make sure that all channels of installed low voltage devices (between 100 VAC...240 VAC) are supplied from the same phase.

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

141.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

142 TU541 24 V DC

- TU541 24 V DC



CAUTION!

Risk of injury and damaging the product!

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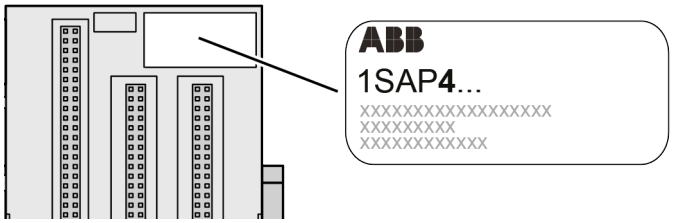
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Hot swap

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Chapter 4 “PLC System” on page 32

XC version **XC** = e**X**treme **C**onditions

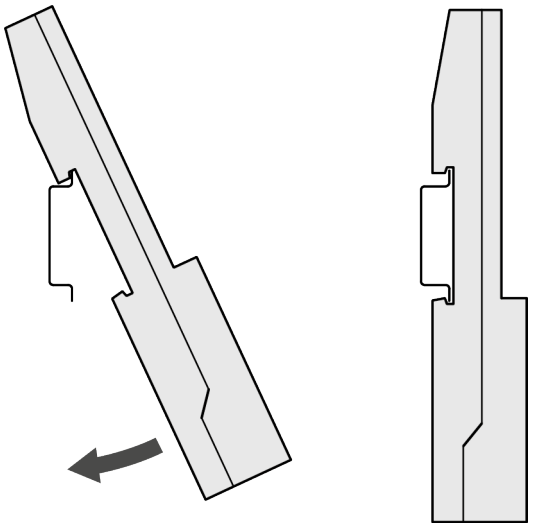


Extreme conditions

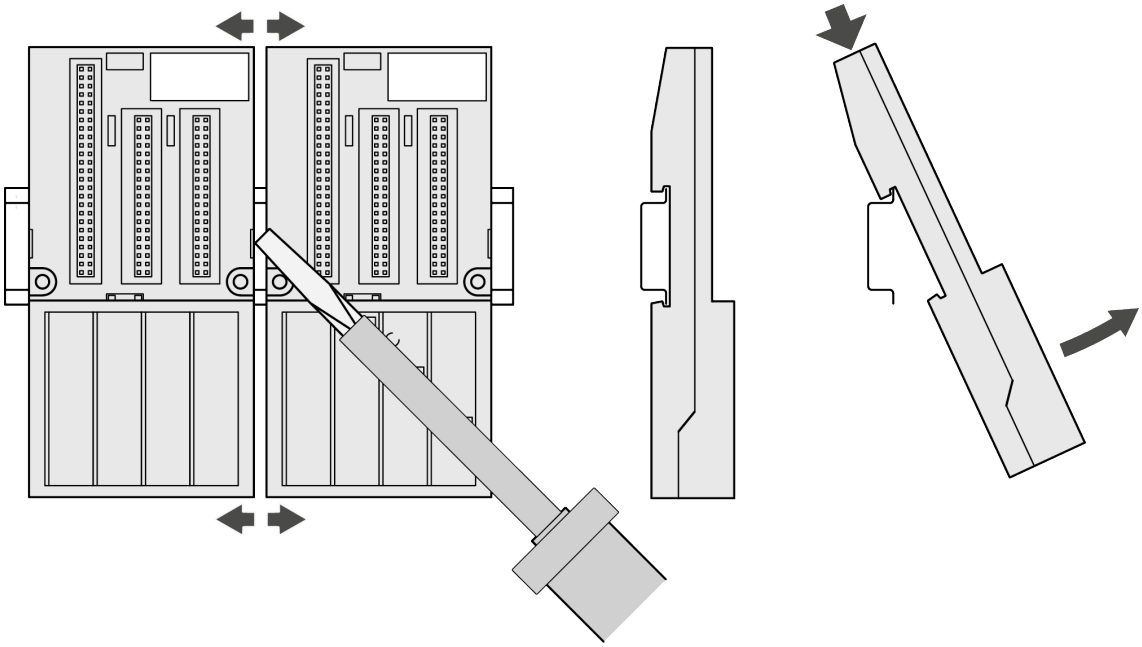
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

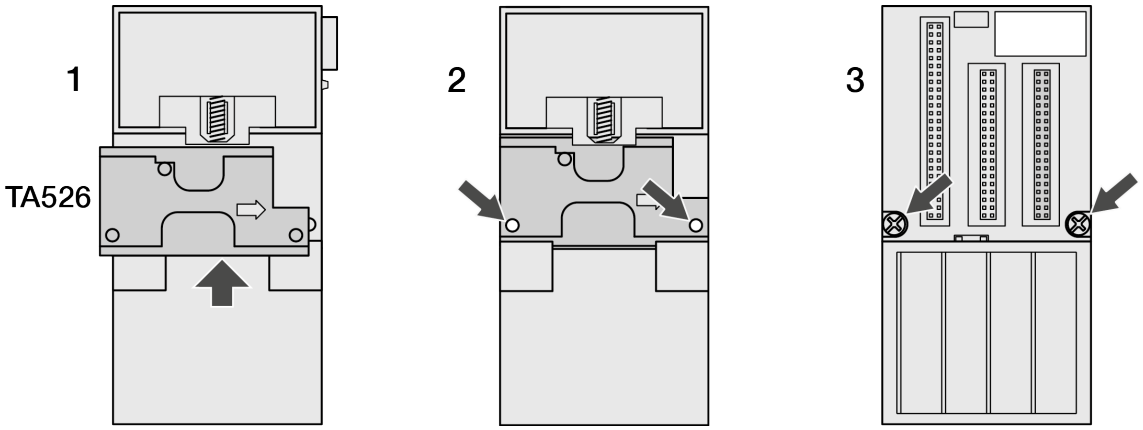
142.1 Assembly



142.2 Disassembly



142.3 Assembly with screws



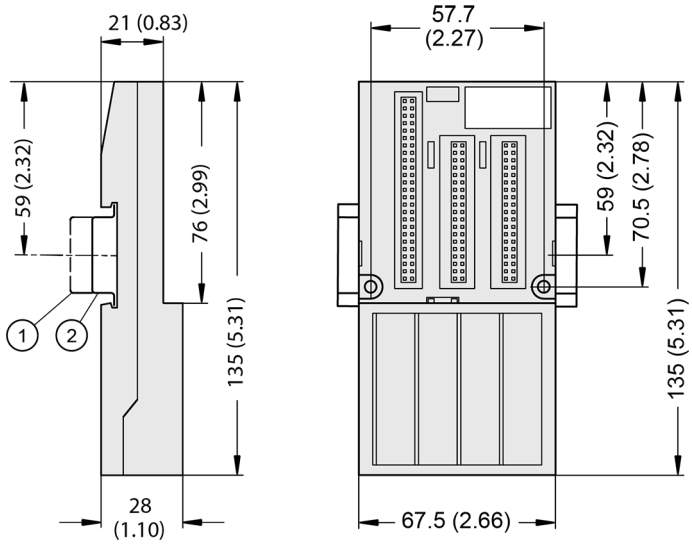
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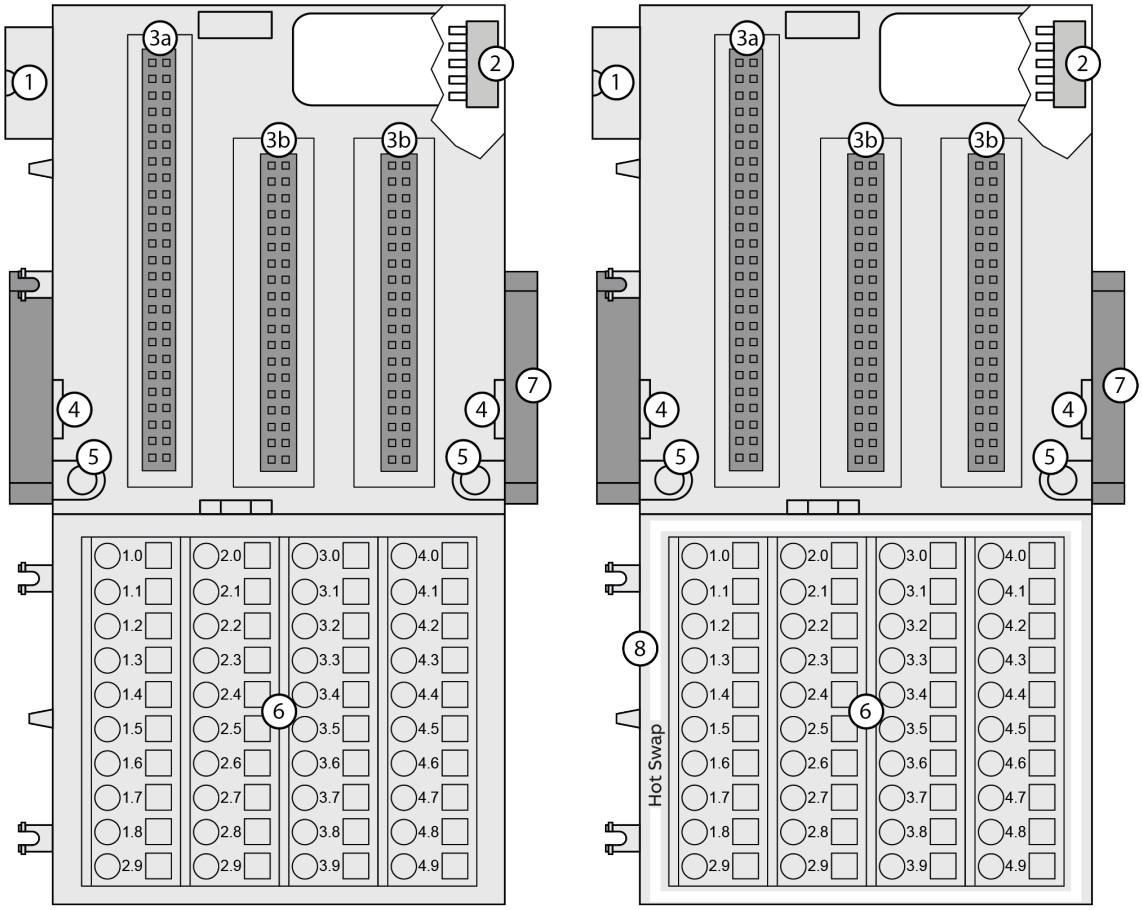
142.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

142.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
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3b Plug (2 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

142.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
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143 TU542(-H)(-XC) 24 V DC

- TU542 24 V DC
- TU542-XC 24 V DC
- TU542-H 24 V DC
- TU542-H-XC 24 V DC



CAUTION!

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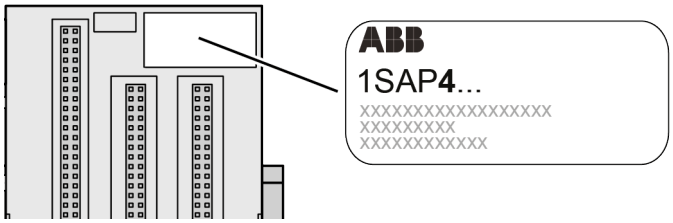
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Hot swap

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↳ *Chapter 4 “PLC System” on page 32*

XC version **XC** = e**X**treme **C**onditions

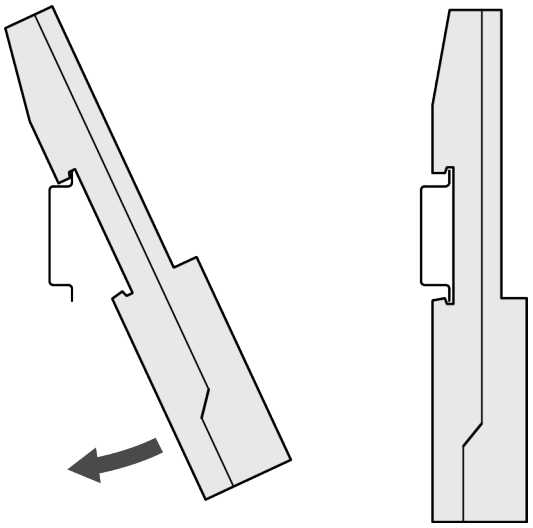


Extreme conditions

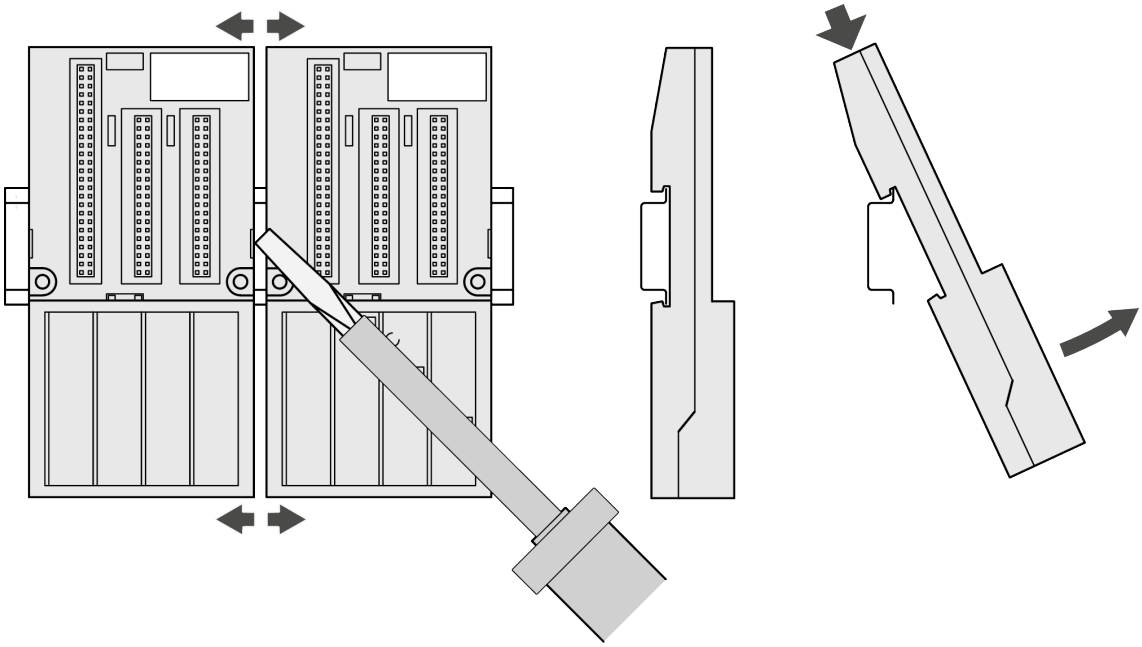
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

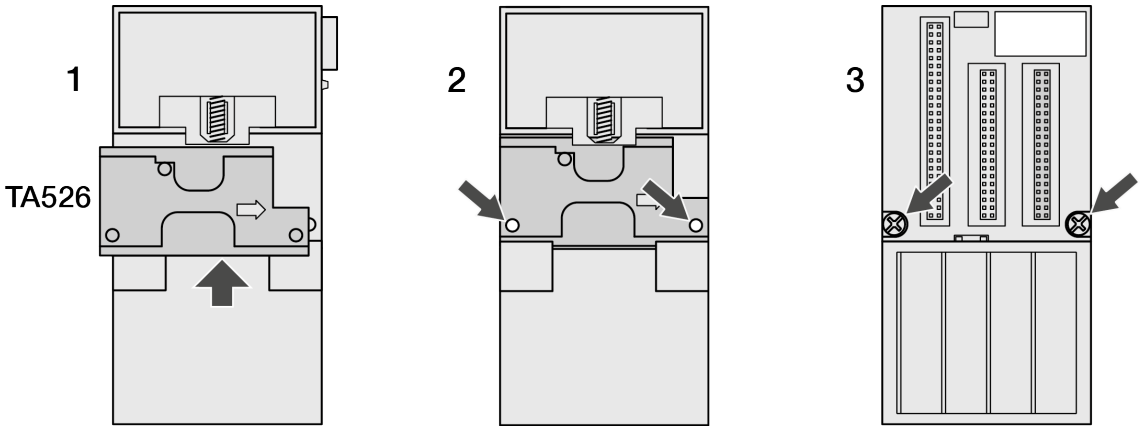
143.1 Assembly



143.2 Disassembly



143.3 Assembly with screws



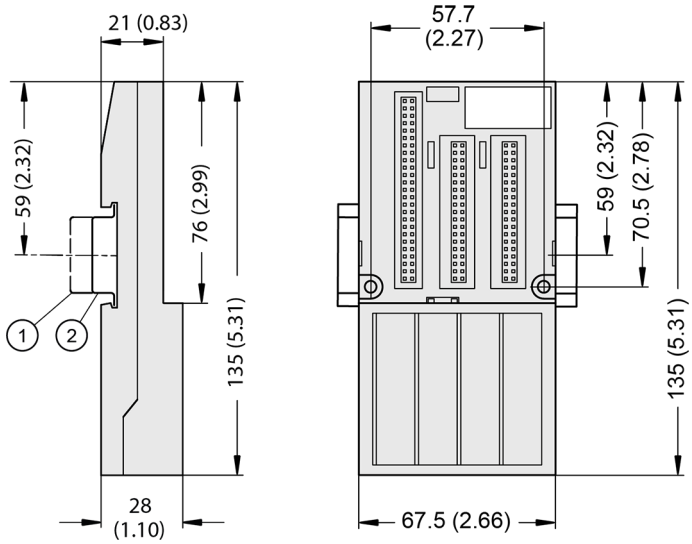
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

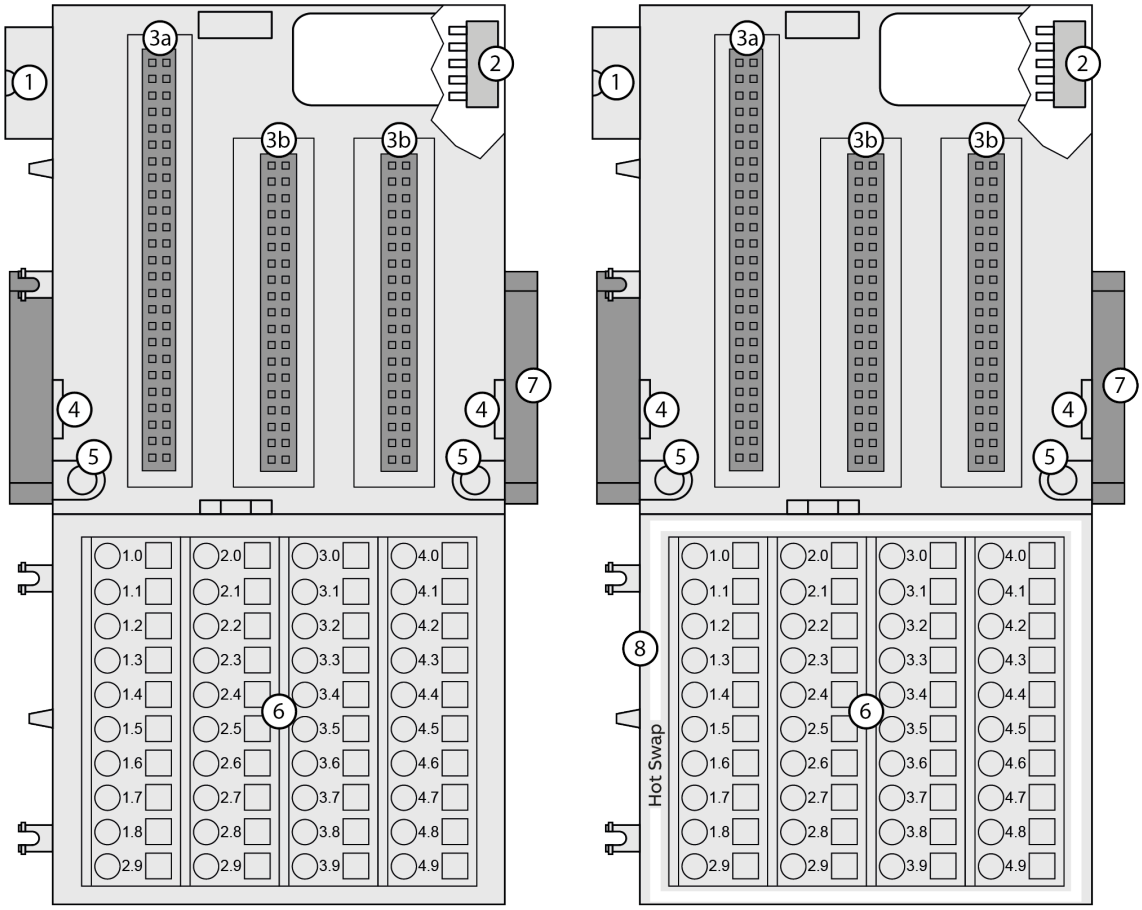
143.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

143.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3a Plug (2 x 25 pins) to connect the inserted I/O modules
3b Plug (2 x 19 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 terminals for signals and process supply voltage
7 DIN rail
8 White border signifies hot swap capability of the terminal unit

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

143.6 Wiring

Proper wires and tools Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

144 TU551-CS31

- TU551-CS31



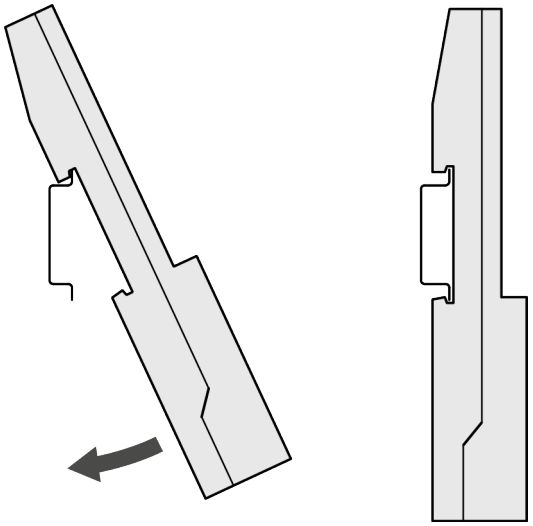
CAUTION!

Risk of injury and damaging the product!

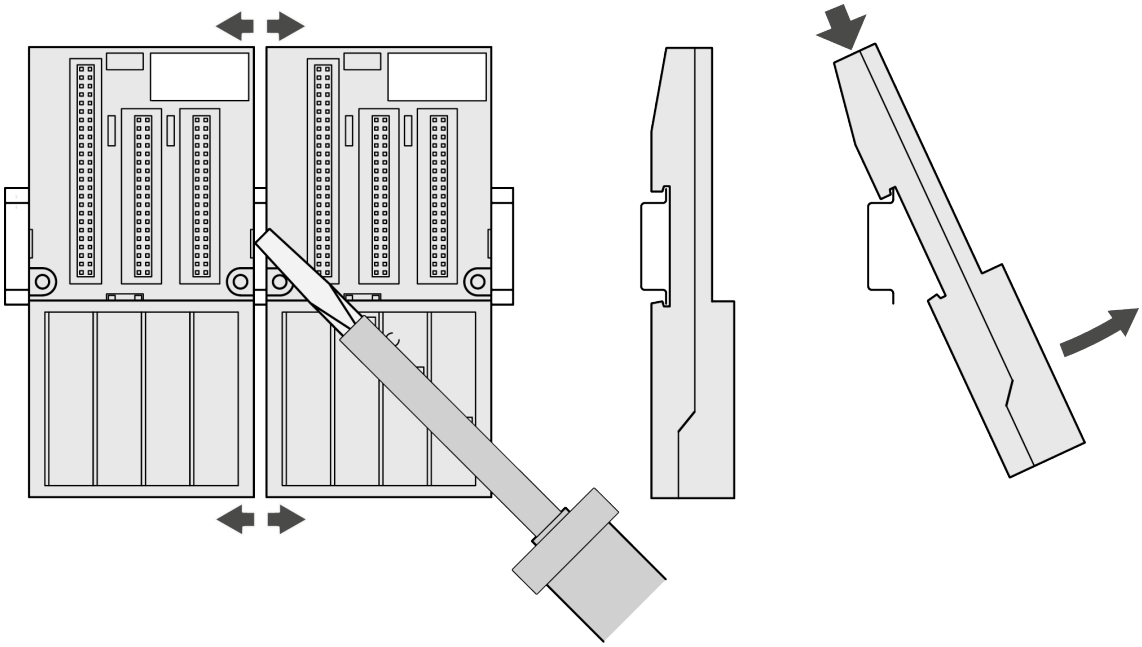
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

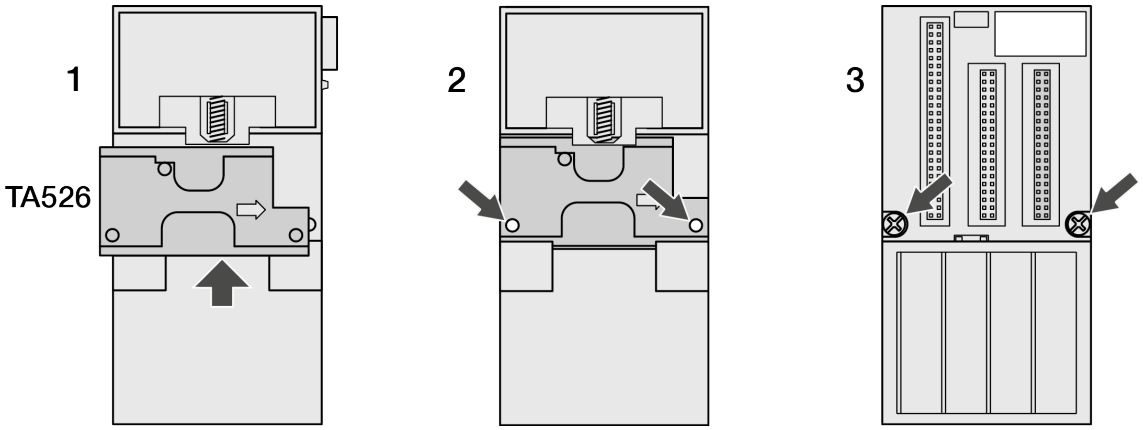
144.1 Assembly



144.2 Disassembly



144.3 Assembly with screws



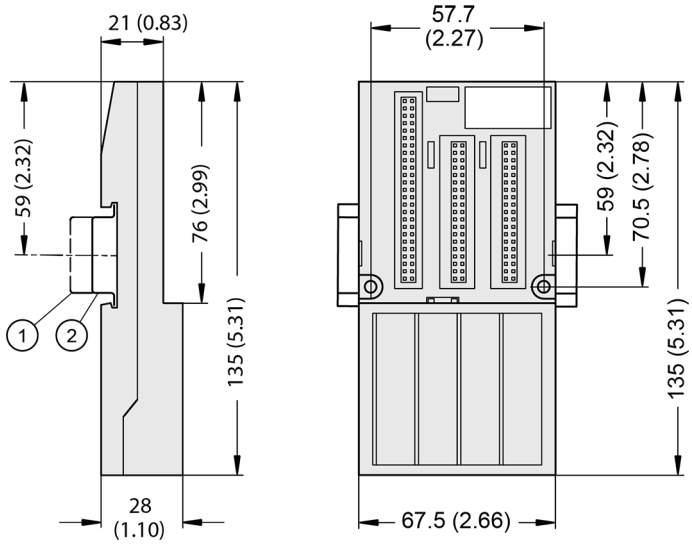
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

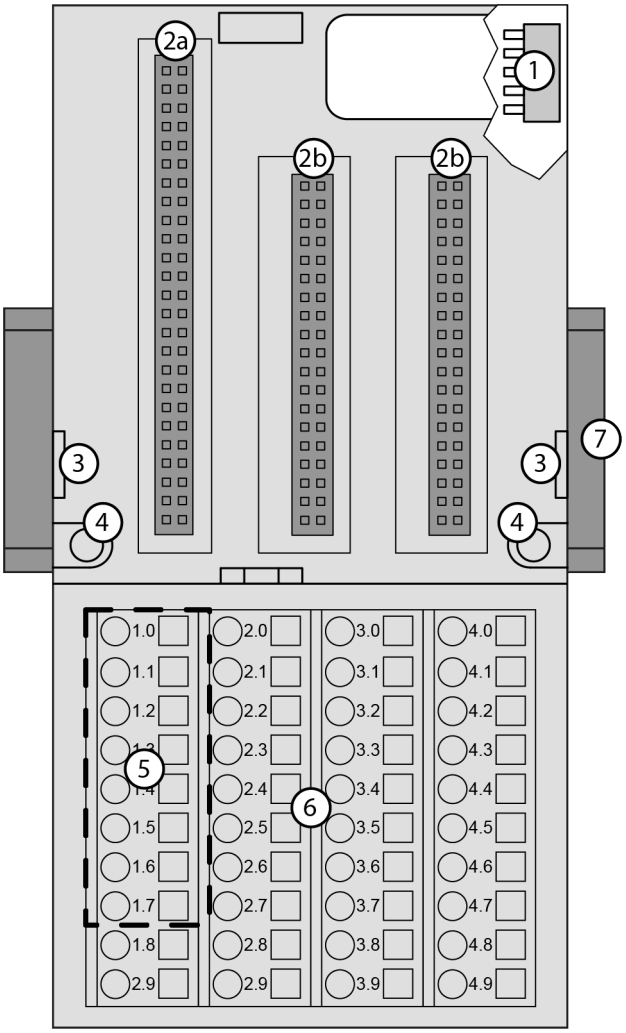
144.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

144.5 Connections



1 I/O bus (10 pins, female) to connect other terminal units
2a Plug (2 25 pins) to connect the inserted I/O modules
2b Plug (2 19 pins) to connect the inserted I/O modules
3 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
4 2 holes for wall mounting
5 CS31 bus interface
6 30 terminals for signals and process supply voltage
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

144.6 Wiring

Proper wires and tools Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

145 TU552-CS31(-XC)

- TU552-CS31
- TU552-CS31-XC



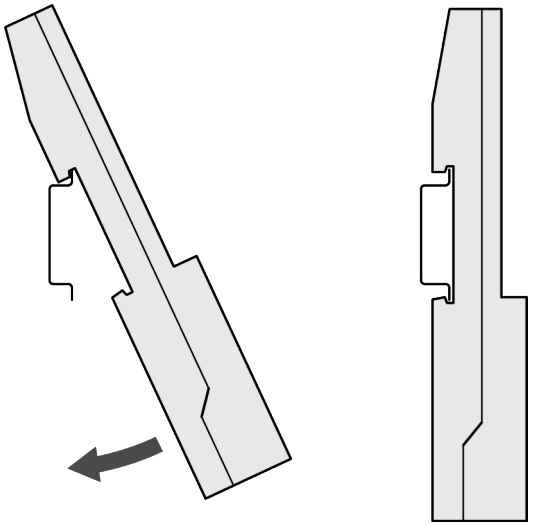
CAUTION!

Risk of injury and damaging the product!

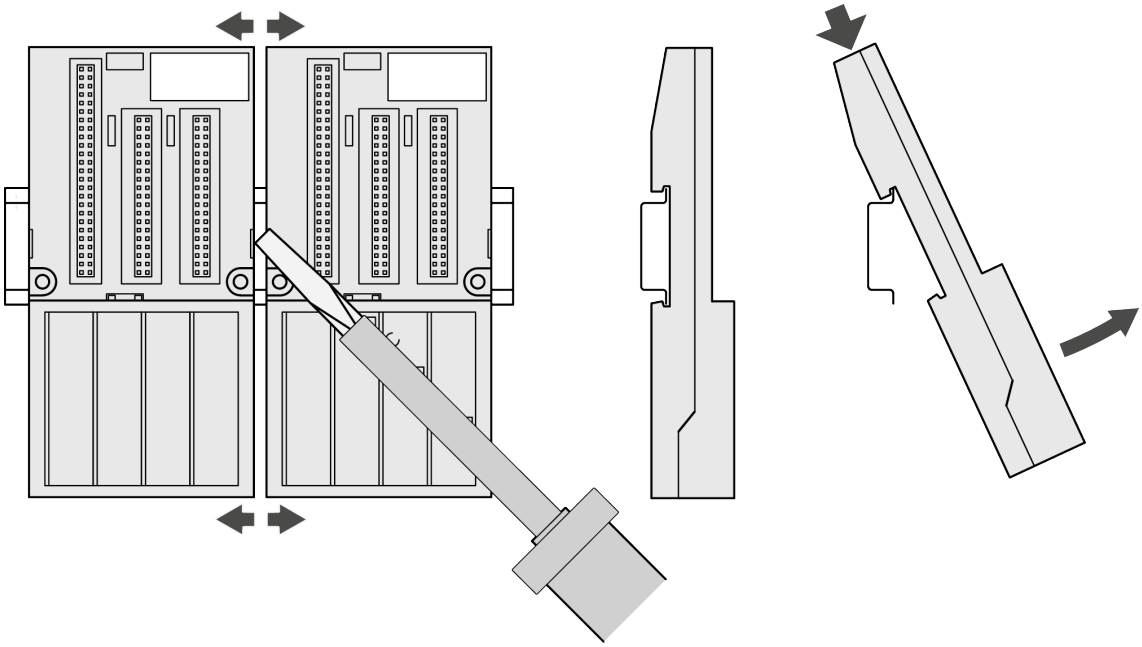
Improper installation and maintenance may result in injury and can damage the product!

- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

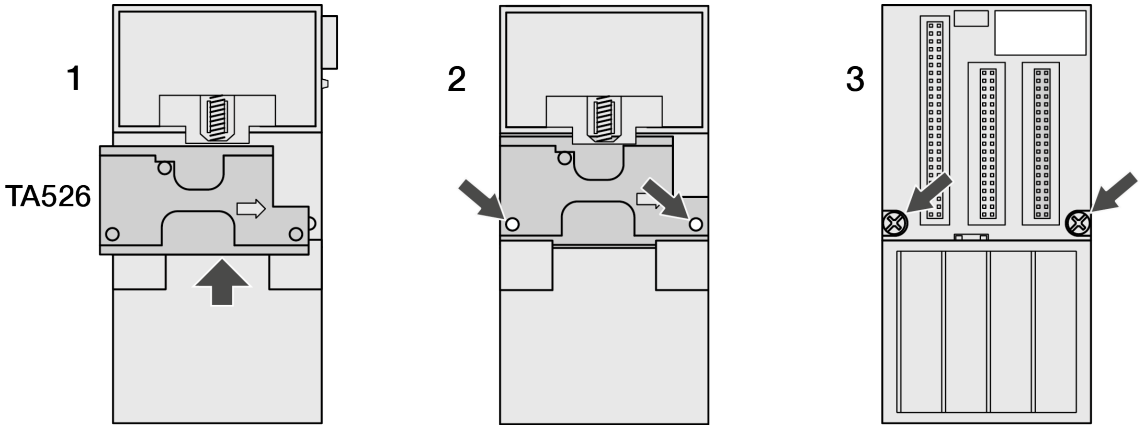
145.1 Assembly



145.2 Disassembly



145.3 Assembly with screws



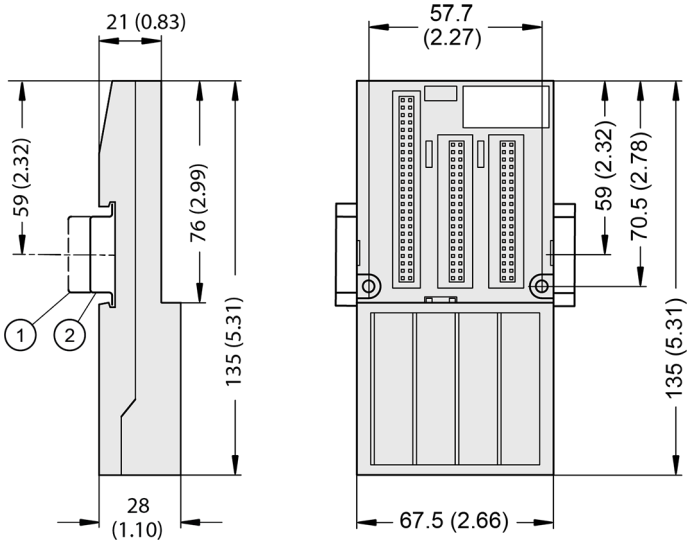
NOTICE!

Use screw mounting accessory to avoid damage!

For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

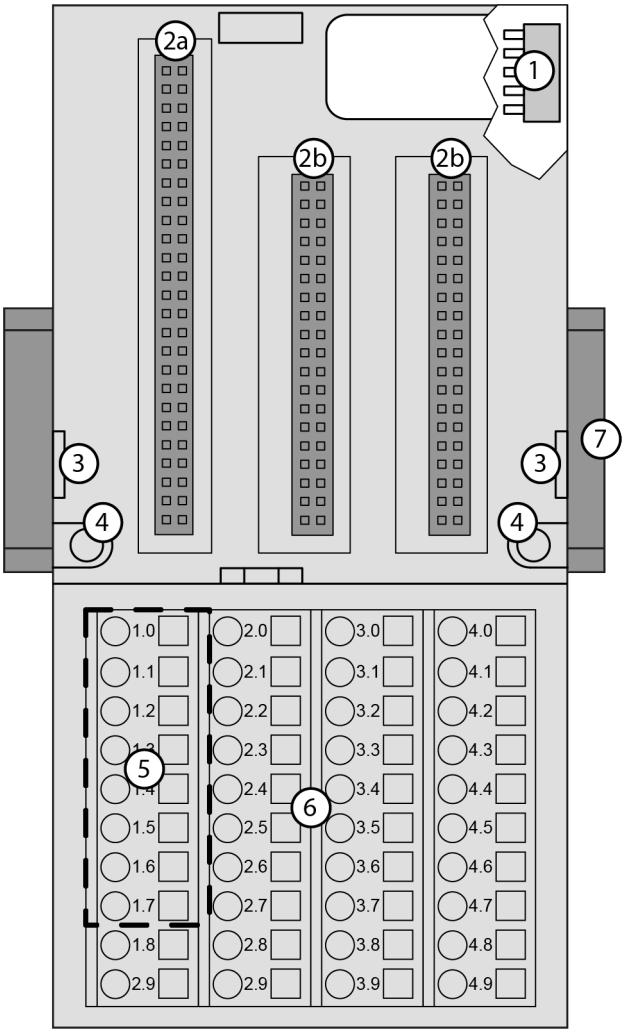
145.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

145.5 Connections

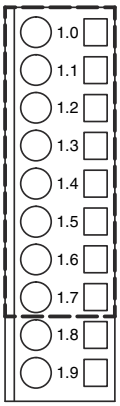


1 I/O bus (10 pins, female) to connect other terminal units
2a Plug (2 25 pins) to connect the inserted I/O modules
2b Plug (2 19 pins) to connect the inserted I/O modules
3 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
4 2 holes for wall mounting
5 CS31 bus interface
6 30 terminals for signals and process supply voltage
7 DIN rail

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

145.5.1 Bus interface

Pin assignment



R1	Resistor + (end-of-line)
R2	Resistor - (end-of-line)
B1	CS31 bus +
B2	CS31 bus -
FE	Functional earth
B1	CS31 bus +
B2	CS31 bus -
FE	Functional earth
UP	24 V DC process voltage
ZP	0 V process voltage

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

145.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

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- TU582-S 24 V DC
- TU582-S-XC 24 V DC



CAUTION!

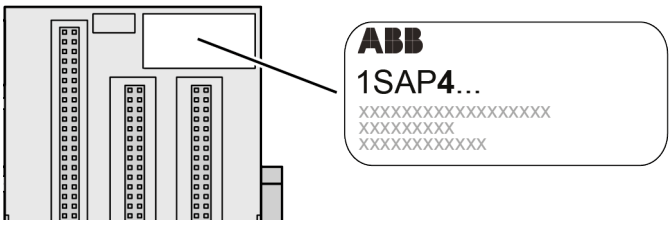
Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

XC version

XC = e**X**treme **C**onditions

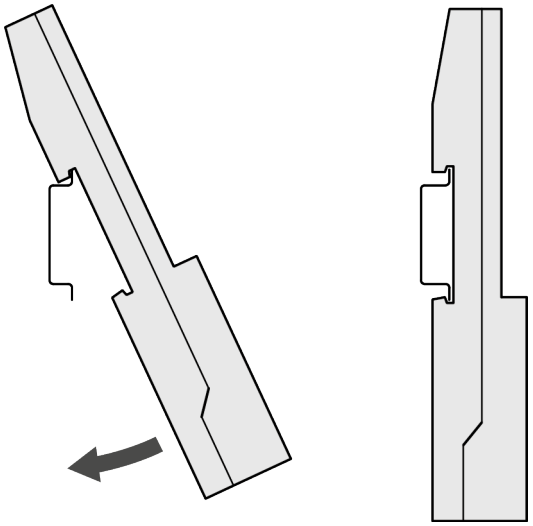


Extreme conditions

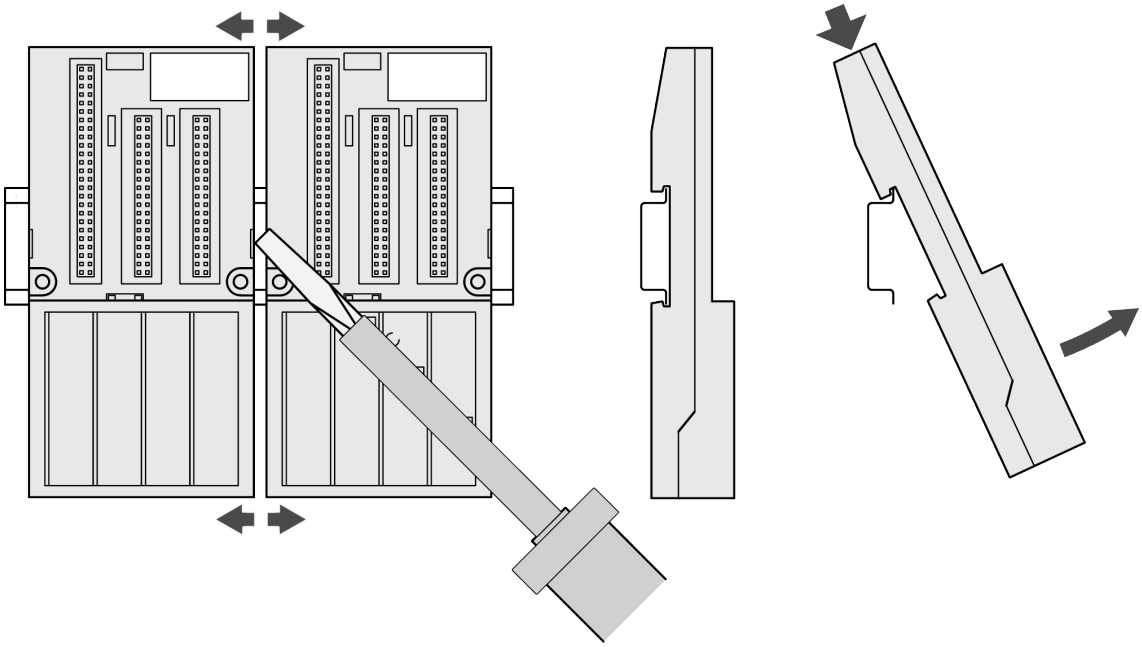
Terminal units for use in extreme ambient conditions have no ❄ sign for XC version.

*The figure **4** in the Part no. 1SAP**4**... (label) identifies the XC version.*

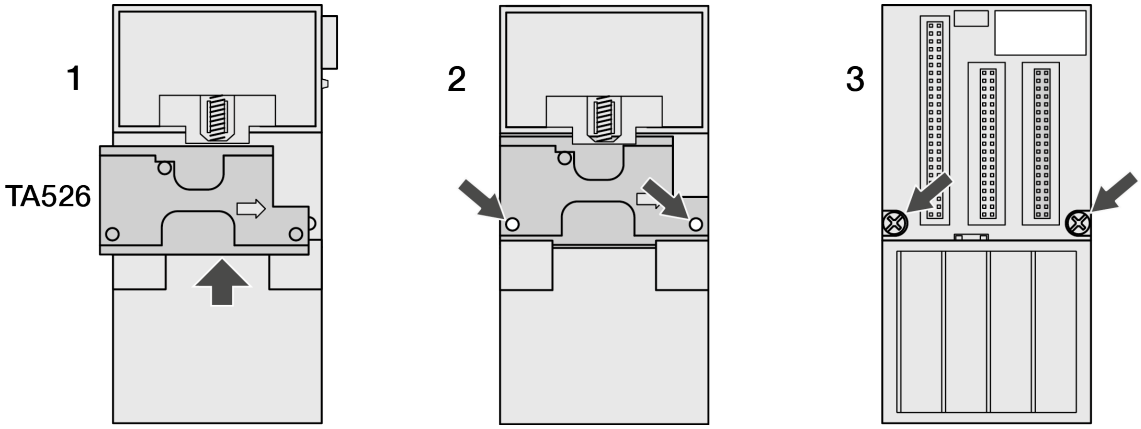
146.1 Assembly



146.2 Disassembly



146.3 Assembly with screws



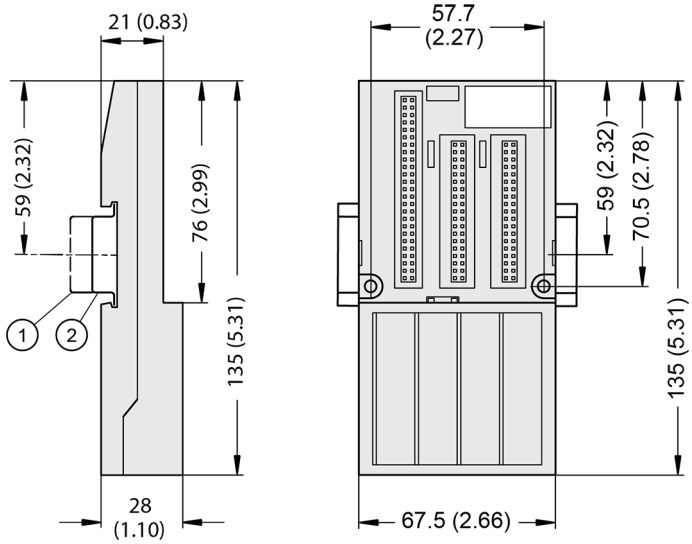
NOTICE!

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For screw mounting, the use of the TA526 screw mounting accessory (1SAP180800R0001) is mandatory to prevent bending and damage to the module.

1. TA526 is snapped on the rear side of the module like DIN rails.
2. Fasten module with screws (M4, max 1.2 Nm) from the front side.

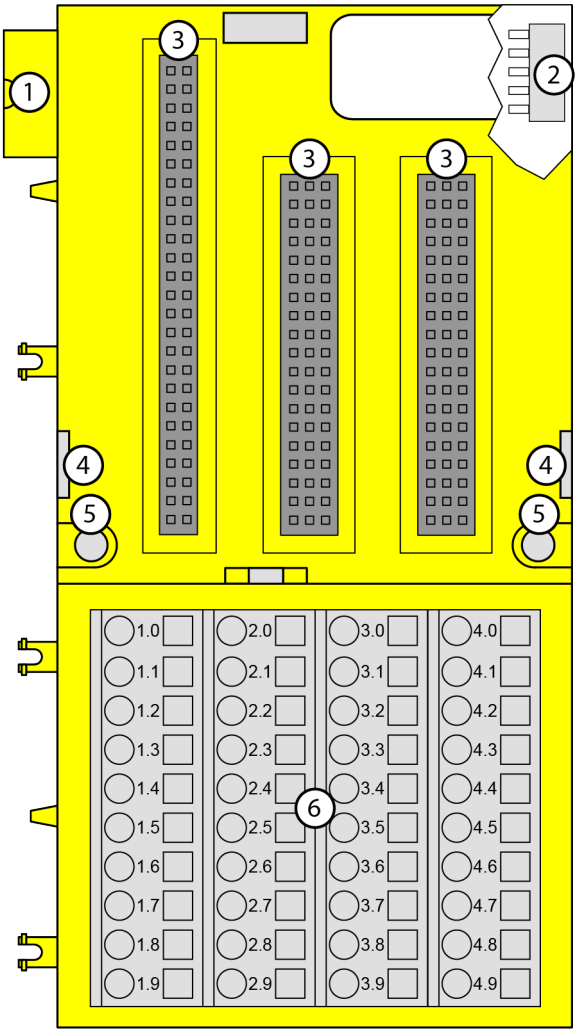
146.4 Dimensions



1 Din rail 15 mm
2 Din rail 7.5 mm

The dimensions are in mm and in brackets in inch.

146.5 Connections



1 I/O bus (10 pins, male) to connect the previous terminal unit, the CPU terminal base or the communication interface module to the terminal unit
2 I/O bus (10 pins, female) to connect other terminal units
3 Plug (1x 50 pins and 2x 57 pins) to connect the inserted I/O modules
4 With a screwdriver inserted in this place, the terminal unit and the adjacent terminal unit can be shoved from each other
5 Holes for screw mounting
6 40 spring terminals for signals and process supply voltage

AC500-S safety user manual

For a detailed description of the connection of the module, please refer to the "AC500-S safety user manual".

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

146.6 Wiring

Proper wires and tools

Make sure that the permissable cable temperature and wire size meets the requirements of target application, current requirement and ambient temperature.

NOTICE!

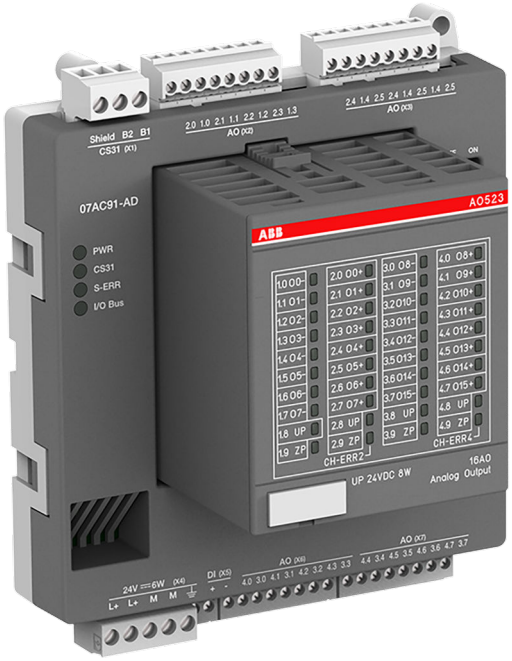
Risk of damaging the device

Use copper conductors only. The field wiring terminals are not suitable for other materials (e.g. aluminium).

Device	Strip length	Spring type	Screw type/ torque	Screw driver	Wire size
TU5xx, TF5xx	9 mm	X	-	0.5 x 3 mm	0.08 - 2.5 mm^2
TU5xx	9 mm	-	0.6 Nm	0.5 x 3 mm	0.08 - 2.5 mm^2

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- 07AC91-AD



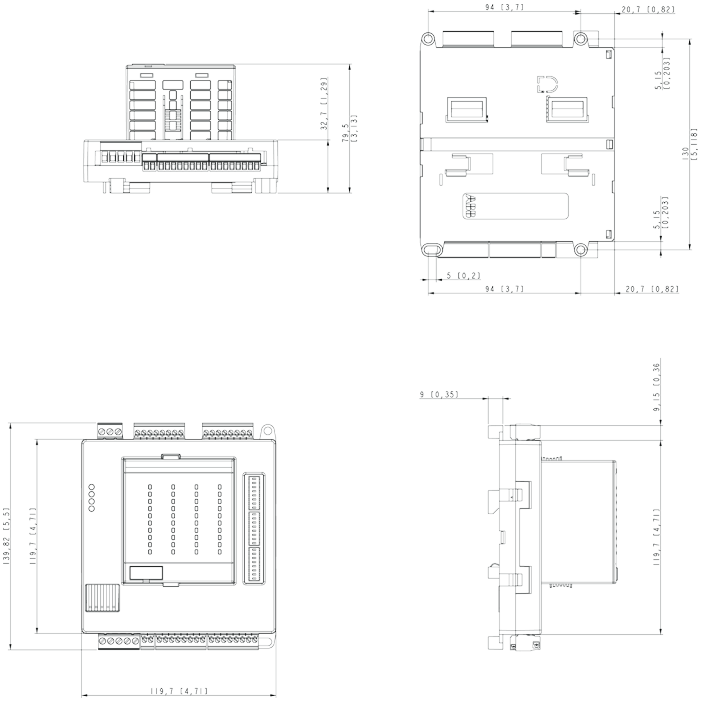
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

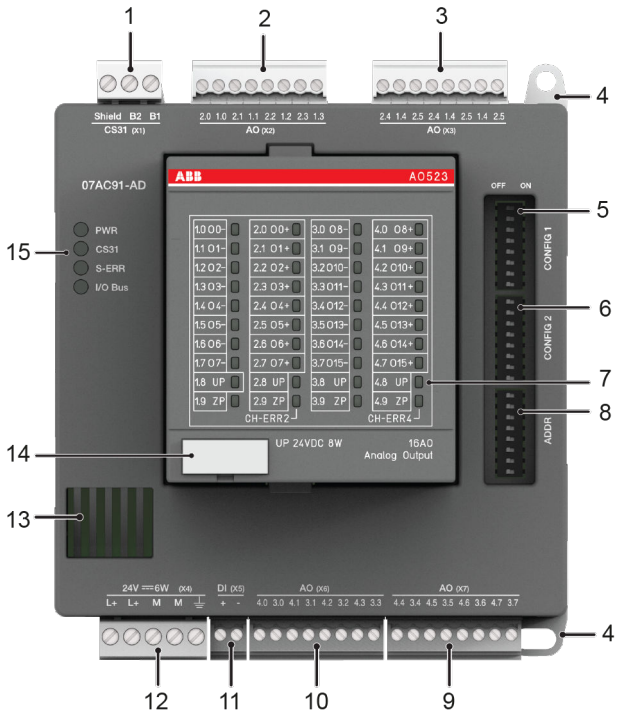
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

147.1 Dimensions



The dimensions are in mm and in brackets in inch.

147.2 Connections

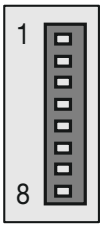


1 Connection for CS31 bus (X1)
2 Analog outputs (X2): 0 ... 10 V, 0 ... 20 mA
3 Analog outputs (X3): 0 ... 10 V

4 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
5 DIP switch for CONFIG1
6 DIP switch for CONFIG2
7 Status LEDs for AO523
8 DIP switch for ADDR
9 Analog outputs (X7): 0 ... 10 V
10 Analog outputs (X6): 0 ... 10 V, 0 ... 20 mA
11 Enabling input for analog outputs (X5)
12 Supply 24 V DC (incl. AO523)
13 Ventilation
14 TA525: Label
15 4 Status LEDs

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

147.2.1 DIP switch for CONFIG1

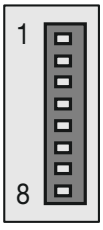


	Switcher number	ON	OFF
	S1	S1 + S2: AO	see 1)
	S2	0...20 mA	0...+10V
	S3	S3 + S4: AO	see 1)
	S4	0...20 mA	0...+10V
	S5	S5 + S6: AO	see 1)
	S6	NC	0...+10V
	S7	S7 + S8: AO	see 1)
	S8	NC	0...+10V

1) Switch must be set to ON in order to initialize the device.

2) Switch must be set to OFF.

147.2.2 DIP switch for CONFIG2

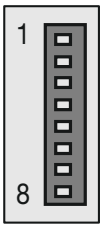


	Switcher number	ON	OFF
	S1	S1 + S2: AO	see 1)
	S2	0...20 mA	0...+10V
	S3	S3 + S4: AO	see 1)
	S4	0...20 mA	0...+10V
	S5	S5 + S6: AO	see 1)
	S6	NC	0...+10V
	S7	S7 + S8: AO	see 1)
	S8	NC	0...+10V

1) Switch must be set to ON in order to initialize the device.

2) Switch must be set to OFF.

147.2.3 DIP switch for ADDR

	Switcher number	ON	OFF
	S1	8-bit	see 1)
	S2	NC	NC
	S3	No monitoring range limits	0
	S4	ADDR: 8	0
	S5	ADDR: 4	0
	S6	ADDR: 2	0
	S7	ADDR: 1	0
	S8	see 2)	NC

1) Switch must be set to ON in order to initialize the device.

2) Switch must be set to OFF.

147.2.4 Plug connection

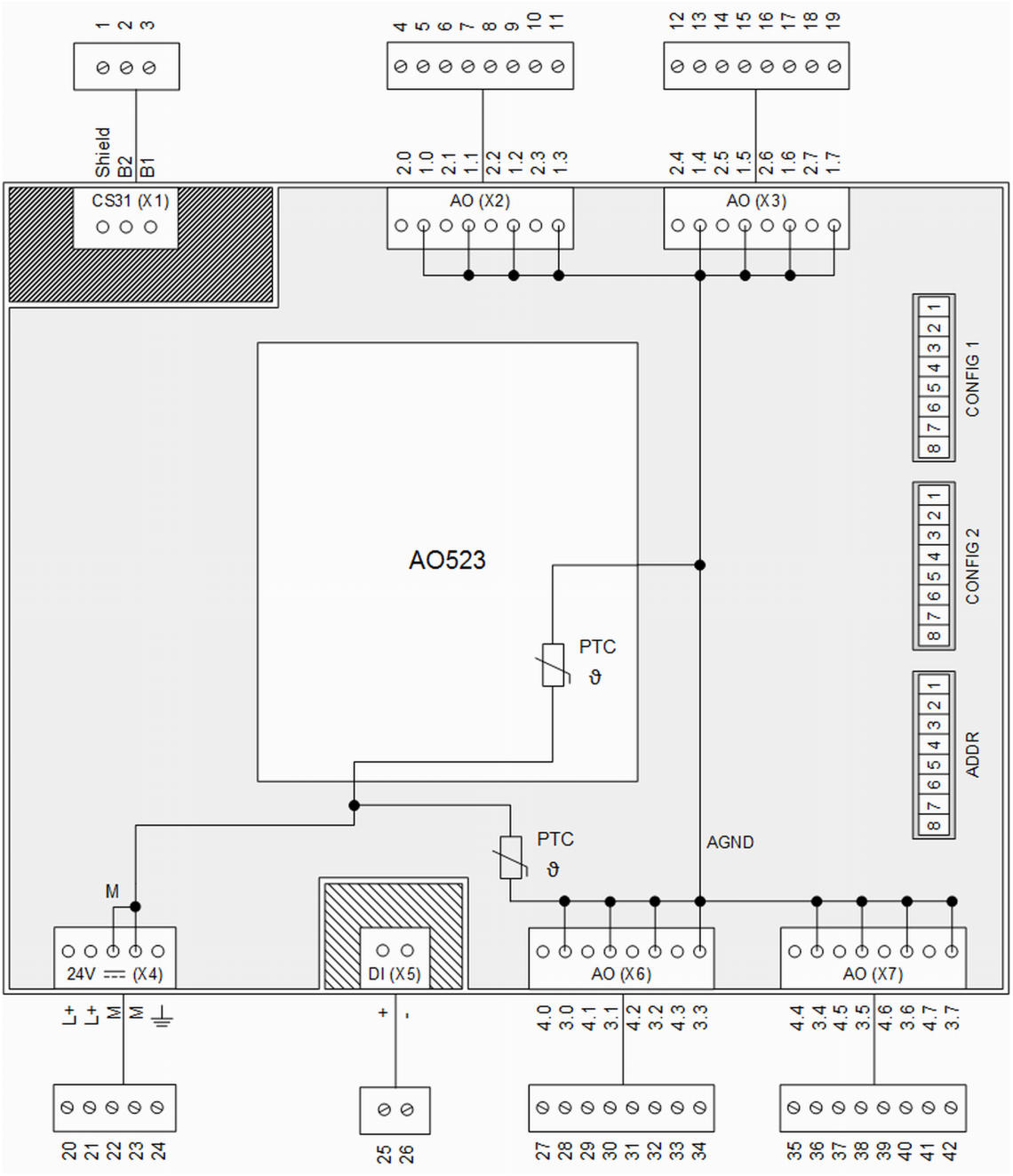


Table 114: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	No internal connection
X1 / B2	2	BUS 2
X1 / B1	3	BUS 1

Table 115: Pin assignment AO (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / 2.0	4	AO523 / O0+
X2 / 1.0	5	AO523 / O0- (AGND)

Connector / Terminal	Pin	Assignment / Signal
X2 / 2.1	6	AO523 / O1+
X2 / 1.1	7	AO523 / O1- (AGND)
X2 / 2.2	8	AO523 / O2+
X2 / 1.2	9	AO523 / O2- (AGND)
X2 / 2.3	10	AO523 / O3+
X2 / 1.3	11	AO523 / O3- (AGND)

Table 116: Pin assignment AO (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / 2.4	12	AO523 / -
X3 / 1.4	13	AO523 / O4- (AGND)
X3 / 2.5	14	AO523 / -
X3 / 1.5	15	AO523 / O5- (AGND)
X3 / 2.6	16	AO523 / -
X3 / 1.6	17	AO523 / O6- (AGND)
X3 / 2.7	18	AO523 / -
X3 / 1.7	19	AO523 / O7- (AGND)

Table 117: Pin assignment 24 V DC 9W (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / L+	20	L+
X4 / L+	21	L+
X4 / M	22	M
X4 / M	23	M
X4 / FE	24	FE

Table 118: Pin assignment DI (X5)

Connector / Terminal	Pin	Assignment / Signal
X5 / +	25	IN+
X5 / -	26	IN- (galvanic isolated ground)

Table 119: Pin assignment AO (X6)

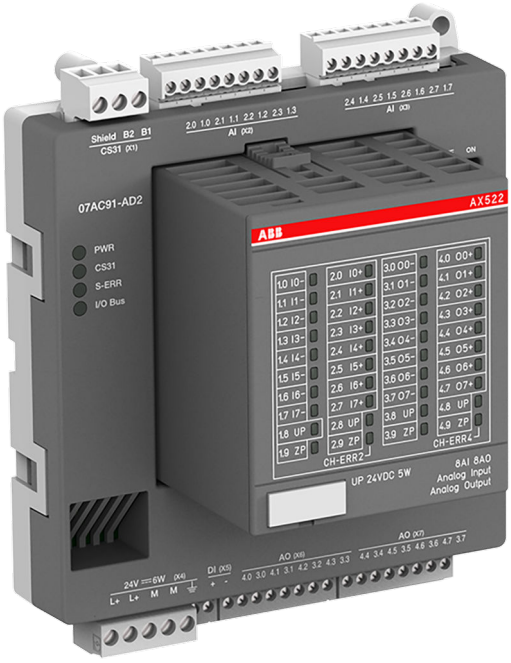
Connector / Terminal	Pin	Assignment / Signal
X6 / 4.0	27	AO523 / O8+
X6 / 3.0	28	AO523 / O8- (AGND)
X6 / 4.1	29	AO523 / O9+
X6 / 3.1	30	AO523 / O9- (AGND)
X6 / 4.2	31	AO523 / O10+
X6 / 3.2	32	AO523 / O10- (AGND)
X6 / 4.3	33	AO523 / O11+
X6 / 3.3	34	AO523 / O11- (AGND)

Table 120: Pin assignment AO (X7)

Connector / Terminal	Pin	Assignment / Signal
X7 / 4.4	35	AO523 / O12+
X7 / 3.4	36	AO523 / O12- (AGND)
X7 / 4.5	37	AO523 / O13+
X7 / 3.5	38	AO523 / O13- (AGND)
X7 / 4.6	39	AO523 / O14+
X7 / 3.6	40	AO523 / O14- (AGND)
X7 / 4.7	41	AO523 / O15+
X7 / 3.7	42	AO523 / O15- (AGND)

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- 07AC91-AD2



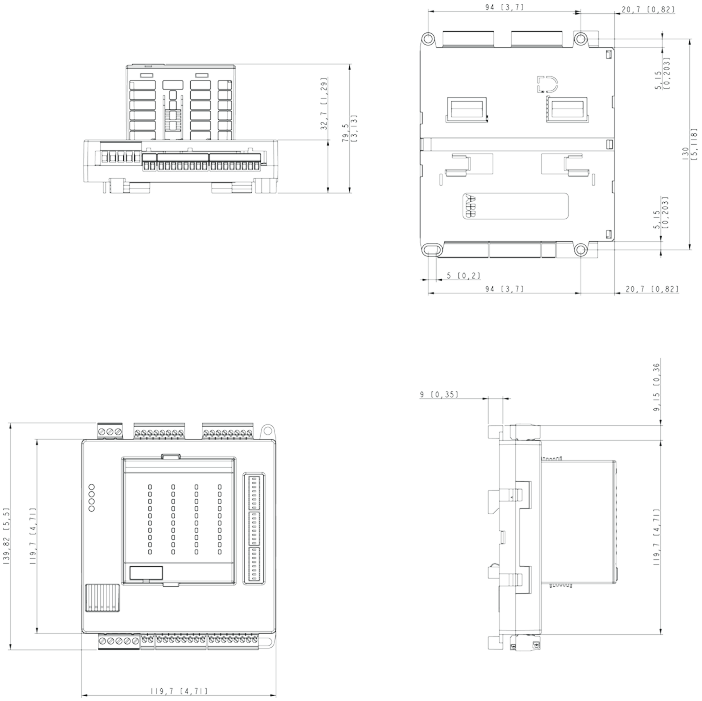
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

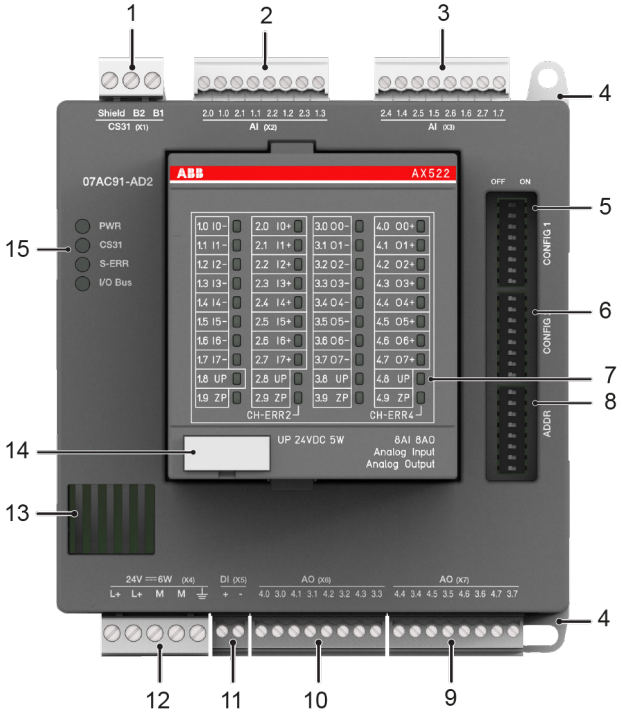
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

148.1 Dimensions



The dimensions are in mm and in brackets in inch.

148.2 Connections

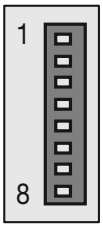


1 Connection for CS31 bus (X1)
2 Analog inputs (X2): -10 V…+10 V, 0…20 mA
3 Analog inputs (X3): -10 V…+10 V, 0…20 mA

4 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
5 DIP switch for CONFIG1
6 DIP switch for CONFIG2
7 Status LEDs for AX522
8 DIP switch for ADDR
9 Analog outputs (X7): -10 V…+10 V
10 Analog outputs (X6): -10 V…+10 V, 0…20 mA
11 Enabling input for analog outputs (X5)
12 Supply 24 V DC (incl. AX522)
13 Ventilation
14 TA525: Label
15 4 Status LEDs

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

148.2.1 DIP switch for CONFIG1

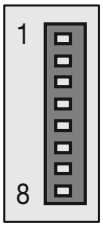


Switcher number	ON	OFF
S1	0...20 mA	-10V...+10V
S2	0...20 mA	-10V...+10V
S3	0...20 mA	-10V...+10V
S4	0...20 mA	-10V...+10V
S5	0...20 mA	-10V...+10V
S6	0...20 mA	-10V...+10V
S7	0...20 mA	-10V...+10V
S8	0...20 mA	-10V...+10V

1) Switch must be set to OFF.

2) Switch must be set to ON in order to initialize the device.

148.2.2 DIP switch for CONFIG2

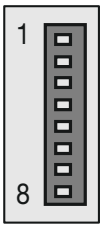


Switcher number	ON	OFF
S1	0...20 mA	-10V...+10V
S2	0...20 mA	-10V...+10V
S3	0...20 mA	-10V...+10V
S4	0...20 mA	-10V...+10V
S5	see 1)	-10V...+10V
S6	see 1)	-10V...+10V
S7	see 1)	-10V...+10V
S8	see 1)	-10V...+10V

1) Switch must be set to OFF.

2) Switch must be set to ON in order to initialize the device.

148.2.3 DIP switch for ADDR

	Switcher number	ON	OFF
	S1	8-bit	see 2)
	S2	NC	NC
	S3	monitoring range limits	0
	S4	ADDR: 8	0
	S5	ADDR: 4	0
	S6	ADDR: 2	0
	S7	ADDR: 1	0
	S8	NC	NC

1) Switch must be set to OFF.

2) Switch must be set to ON in order to initialize the device.

148.2.4 Plug connection

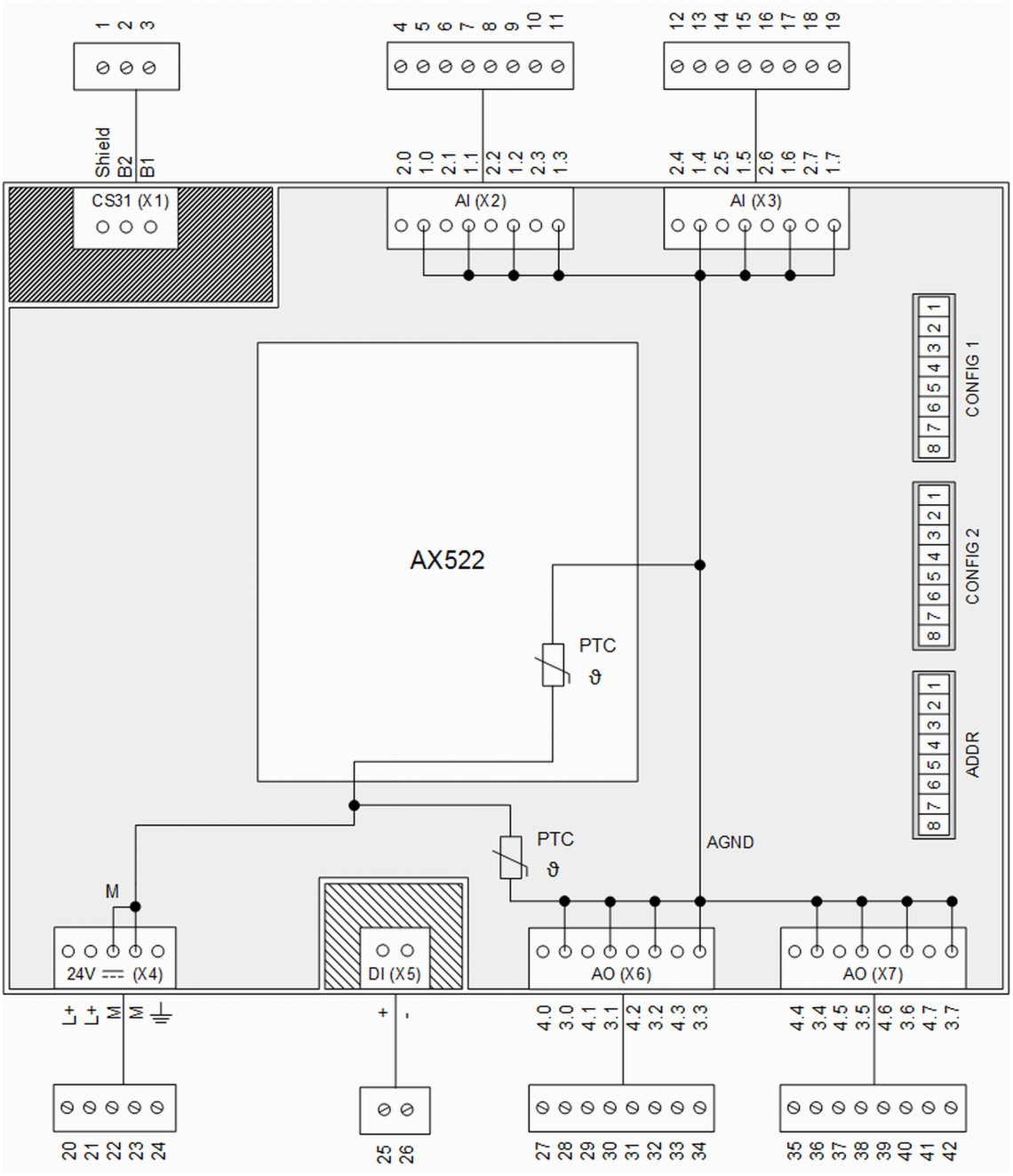


Table 121: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	No internal connection
X1 / B2	2	BUS 2
X1 / B1	3	BUS 1

Table 122: Pin assignment AI (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / 2.0	4	AX522 / I0+
X2 / 1.0	5	AX522 / I0- (AGND)

Connector / Terminal	Pin	Assignment / Signal
X2 / 2.1	6	AX522 / I1+
X2 / 1.1	7	AX522 / I1- (AGND)
X2 / 2.2	8	AX522 / I2+
X2 / 1.2	9	AX522 / I2- (AGND)
X2 / 2.3	10	AX522 / I3+
X2 / 1.3	11	AX522 / I3- (AGND)

Table 123: Pin assignment AI (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / 2.4	12	AX522 / I4+
X3 / 1.4	13	AX522 / I4- (AGND)
X3 / 2.5	14	AX522 / I5+
X3 / 1.5	15	AX522 / I5- (AGND)
X3 / 2.6	16	AX522 / I6+
X3 / 1.6	17	AX522 / I6- (AGND)
X3 / 2.7	18	AX522 / I7+
X3 / 1.7	19	AX522 / I7- (AGND)

Table 124: Pin assignment 24 V DC 6W (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / L+	20	L+
X4 / L+	21	L+
X4 / M	22	M
X4 / M	23	M
X4 / FE	24	FE

Table 125: Pin assignment DI (X5)

Connector / Terminal	Pin	Assignment / Signal
X5 / +	25	IN+
X5 / -	26	IN- (galvanic isolated ground)

Table 126: Pin assignment AO (X6)

Connector / Terminal	Pin	Assignment / Signal
X6 / 4.0	27	AX522 / O0+
X6 / 3.0	28	AX522 / O0- (AGND)
X6 / 4.1	29	AX522 / O1+
X6 / 3.1	30	AX522 / O1- (AGND)
X6 / 4.2	31	AX522 / O2+
X6 / 3.2	32	AX522 / O2- (AGND)
X6 / 4.3	33	AX522 / O3+
X6 / 3.3	34	AX522 / O3- (AGND)

Table 127: Pin assignment AO (X7)

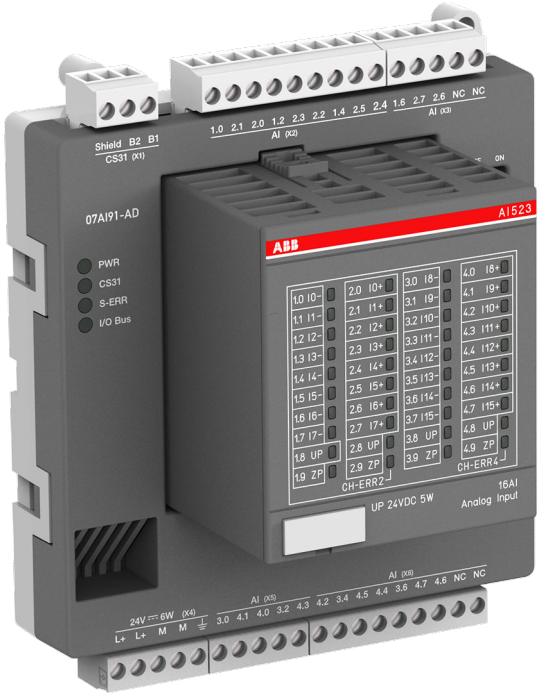
Connector / Terminal	Pin	Assignment / Signal
X7 / 4.4	35	AX522 / O4+
X7 / 3.4	36	AX522 / O4- (AGND)
X7 / 4.5	37	AX522 / O5+
X7 / 3.5	38	AX522 / O5- (AGND)
X7 / 4.6	39	AX522 / O6+
X7 / 3.6	40	AX522 / O6- (AGND)
X7 / 4.7	41	AX522 / O7+
X7 / 3.7	42	AX522 / O7- (AGND)



The outputs on connector X7 cannot be configured as current outputs.

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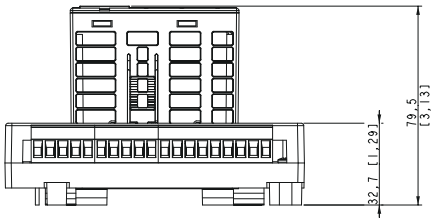
CAUTION!

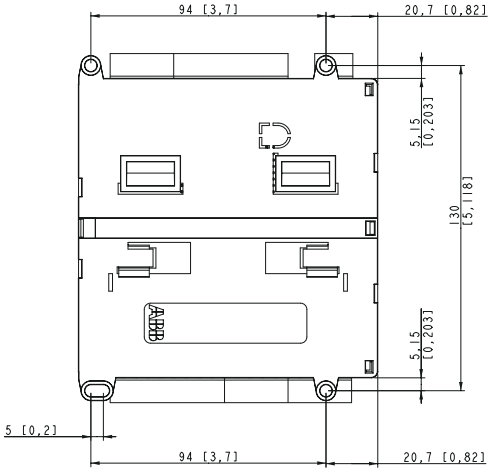
Risk of injury and damaging the product!

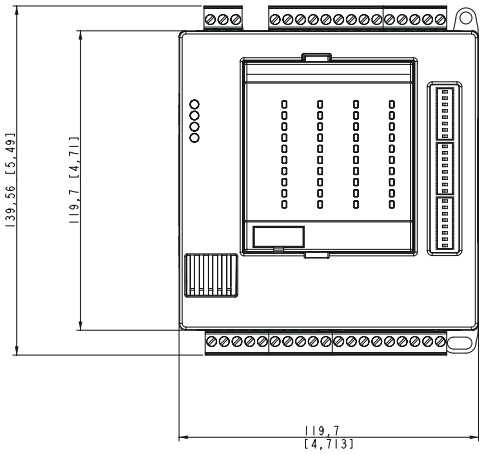
Improper installation and maintenance may result in injury and can damage the product!

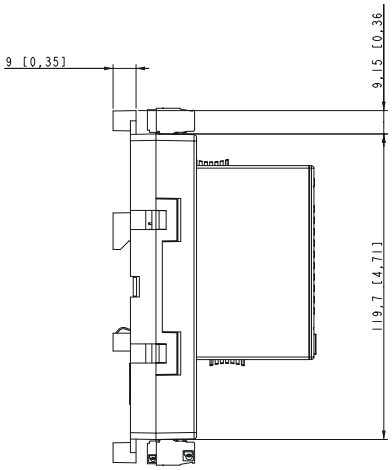
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

149.1 Dimensions



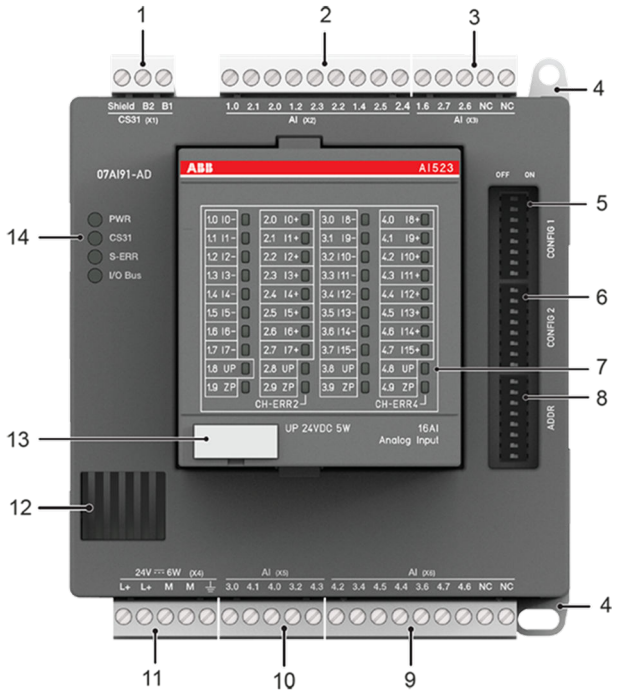






The dimensions are in mm and in brackets in inch.

149.2 Connections



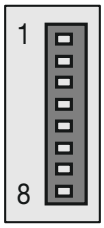
1 Connection for CS31 bus (X1)
2 Analog inputs (X2). 2.5 AI (± 10 V differential, ± 5 V differential, temperature measurement PT100 / PT1000, 4…20 mA and 0…20 mA with external resistor)
3 Analog inputs (X3). 1.5 AI (± 10 V differential, ± 5 V differential, temperature measurement PT100 / PT1000, 4…20 mA and 0…20 mA with external resistor)
4 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
5 DIP switch for CONFIG1
6 DIP switch for CONFIG2
7 Status LEDs for AI523
8 DIP switch for ADDR
9 Analog inputs (X6). 2.5 AI (± 10 V differential, ± 5 V differential, temperature measurement PT100 / PT1000, 4…20 mA and 0…20 mA with external resistor)
10 Analog inputs (X5). 1.5 AI (± 10 V differential, ± 5 V differential, temperature measurement PT100 / PT1000, 4…20 mA and 0…20 mA with external resistor)
11 Supply 24 V DC (incl. AI523)
12 Ventilation
13 TA525: Label
14 4 Status LEDs of complete device

In contrast to the existing device, the following measuring ranges are not available in the replacement device: ± 500 mV, ± 50 mV. Temperature measurement with thermocouples is also not possible.

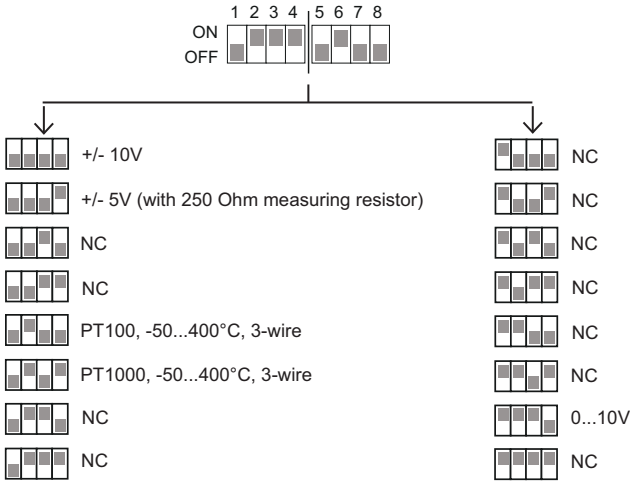
The replacement device does not perform a self-calibration.

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

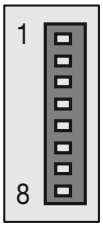
149.2.1 DIP switch for CONFIG1 / CONFIG2



Configuration options for DIP switches CONFIG1 and CONFIG2. Configuration in blocks of 4 switches.

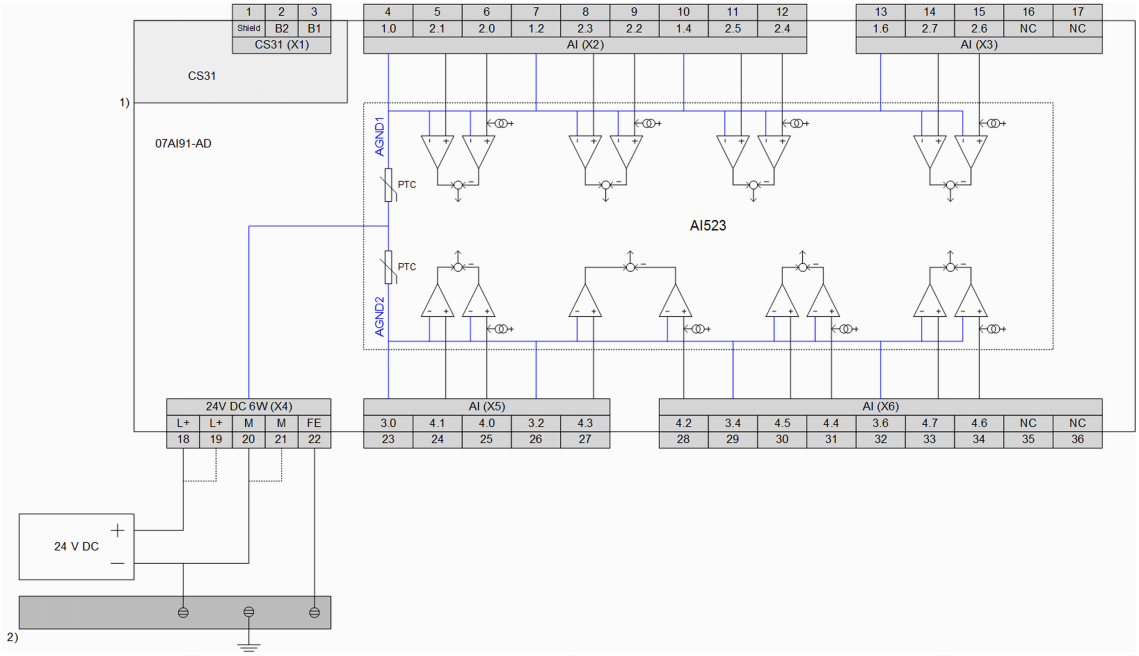


149.2.2 DIP switch for ADDR

	Switcher number	ON	OFF
	S1	NC	NC
	S2	NC	NC
	S3	CS31	see 1)
	S4	ADDR: 8	0
	S5	ADDR: 4	0
	S6	ADDR: 2	0
	S7	ADDR: 1	0
	S8	NC	NC

1) Switch must be set to ON in order to initialize the device.

149.2.3 Plug connection



1) Galvanic isolation
2) Control cabinet grounding

Table 128: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	No internal connection
X1 / B2	2	BUS 2
X1 / B1	3	BUS 1

Table 129: Pin assignment AI (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / 1.0	4	AI523 / I0- (AGND1)
X2 / 2.1	5	AI523 / I1+
X2 / 2.0	6	AI523 / I0+
X2 / 1.2	7	AI523 / I2- (AGND1)
X2 / 2.3	8	AI523 / I3+
X2 / 2.2	9	AI523 / I2+
X2 / 1.4	10	AI523 / I4- (AGND1)
X2 / 2.5	11	AI523 / I5+
X2 / 2.4	12	AI523 / I4+

Table 130: Pin assignment AI (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / 1.6	13	AI523 / I6- (AGND1)
X3 / 2.7	14	AI523 / I7+
X3 / 2.6	15	AI523 / I6+

Connector / Terminal	Pin	Assignment / Signal
X3 / NC	16	Not connected
X3 / NC	17	Not connected

Table 131: Pin assignment 24 V DC 6W (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / L+	18	L+
X4 / L+	19	L+
X4 / M	20	M
X4 / M	21	M
X4 / FE	22	FE

Table 132: Pin assignment AI (X5)

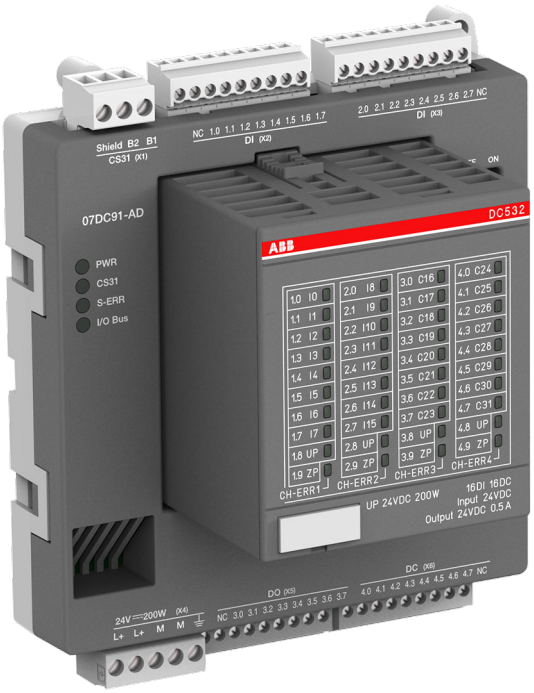
Connector / Terminal	Pin	Assignment / Signal
X5 / 3.0	23	AI523 / I8- (AGND2)
X5 / 4.1	24	AI523 / I9+
X5 / 4.0	25	AI523 / I8+
X5 / 3.2	26	AI523 / I10- (AGND2)
X5 / 4.3	27	AI523 / I11+

Table 133: Pin assignment AI (X6)

Connector / Terminal	Pin	Assignment / Signal
X6 / 4.2	28	AI523 / I10+
X6 / 3.4	29	AI523 / I12- (AGND2)
X6 / 4.5	30	AI523 / I13+
X6 / 4.4	31	AI523 / I12+
X6 / 3.6	32	AI523 / I14- (AGND2)
X6 / 4.7	33	AI523 / I15+
X6 / 4.6	34	AI523 / I14+
X6 / NC	35	Not connected
X6 / NC	36	Not connected

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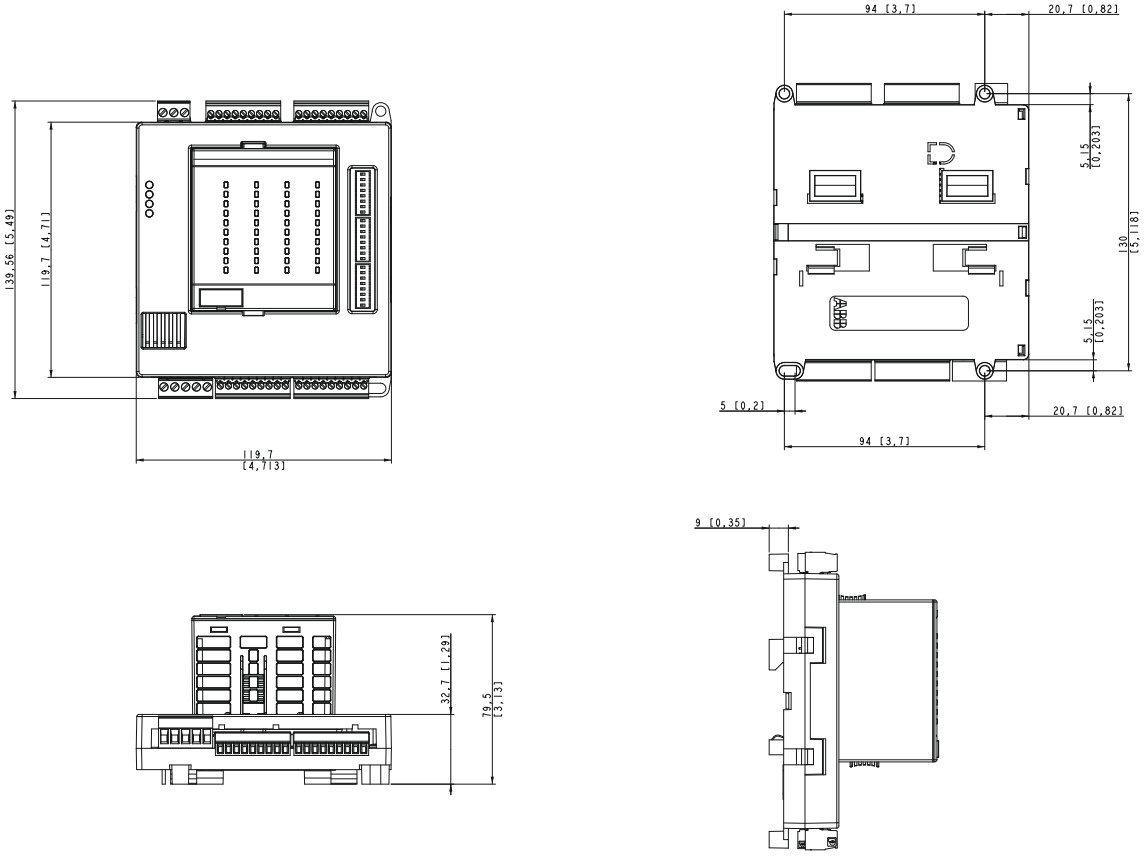
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

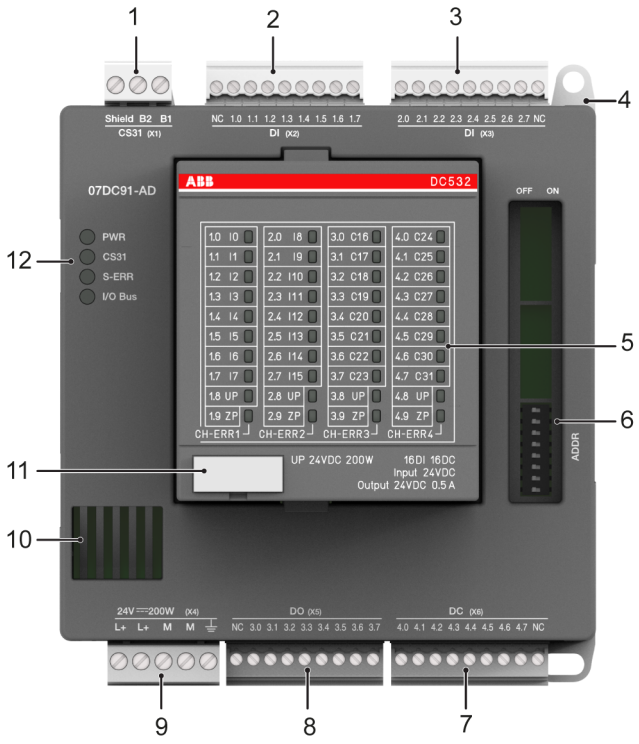
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

150.1 Dimensions



The dimensions are in mm and in brackets in inch.

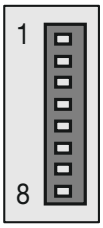
150.2 Connections



1 Connection for CS31 bus (X1)
2 8 digital inputs 24 V DC (X2)
3 8 digital inputs 24 V DC (X3)
4 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
5 Status LEDs for DC532
6 DIP switch for address setting (ADDR)
7 8 digital inputs/outputs 24 V DC / 0.5 A (X6)
8 8 digital outputs (X5)
9 Supply 24 V DC (X4)
10 Ventilation
11 TA525: Label
12 4 Status LEDs

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

150.2.1 DIP switch for ADDR

	Switcher number	ON	OFF
	S1	16 I/ 16 O	16 I/ 8 O / 8 DC
	S2	ADDR: 32	0
	S3	ADDR: 16	0
	S4	ADDR: 8	0
	S5	ADDR: 4	0

	Switcher number	ON	OFF
	S6	ADDR: 2	0
	S7	ADDR: 1	0
	S8	NC	NC

150.2.2 Plug connection

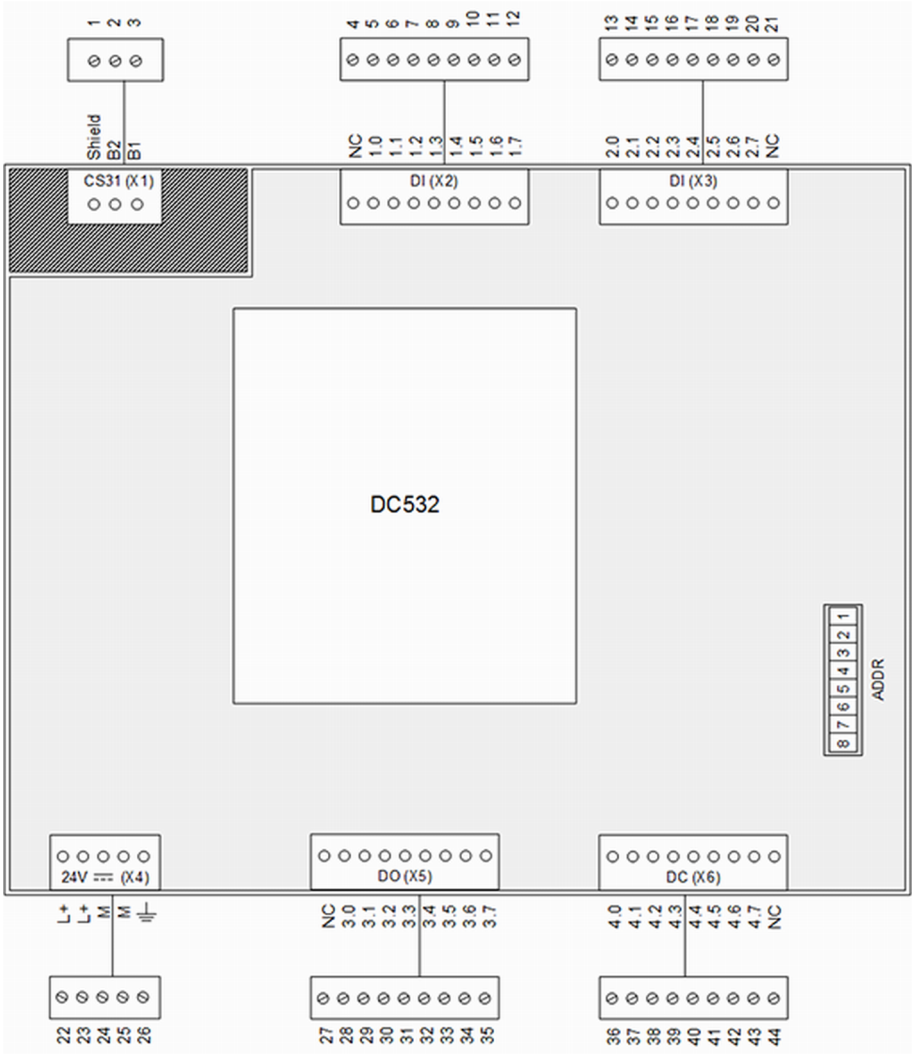


Table 134: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	No internal connection
X1 / B2	2	BUS 2
X1 / B1	3	BUS 1

Table 135: Pin assignment DI (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / NC	4	No internal connection
X2 / 1.0	5	DC532 / I0
X2 / 1.1	6	DC532 / I1
X2 / 1.2	7	DC532 / I2
X2 / 1.3	8	DC532 / I3
X2 / 1.4	9	DC532 / I4
X2 / 1.5	10	DC532 / I5
X2 / 1.6	11	DC532 / I6
X2 / 1.7	12	DC532 / I7

Table 136: Pin assignment DI (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / 2.0	13	DC532 / I8
X3 / 2.1	14	DC532 / I9
X3 / 2.2	15	DC532 / I10
X3 / 2.3	16	DC532 / I11
X3 / 2.4	17	DC532 / I12
X3 / 2.5	18	DC532 / I13
X3 / 2.6	19	DC532 / I14
X3 / 2.7	20	DC532 / I15
X3 / NC	21	No internal connection

Table 137: Pin assignment 24 V DC 200 W (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / L+	22	L+
X4 / L+	23	L+
X4 / M	24	M
X4 / M	25	M
X4 / FE	26	FE

Table 138: Pin assignment DO (X5)

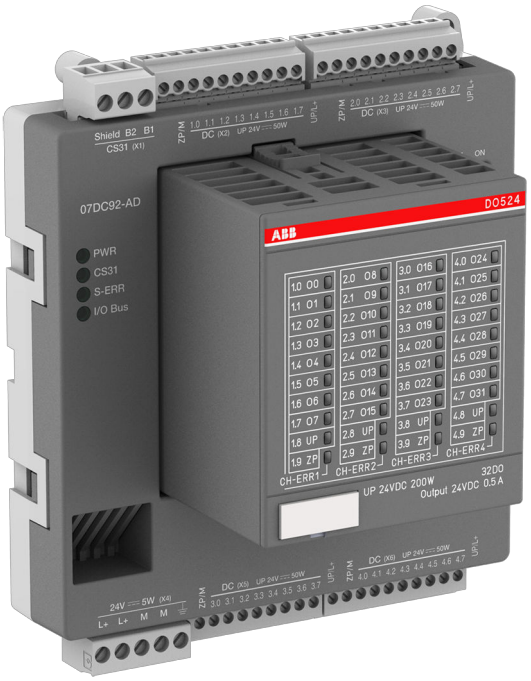
Connector / Terminal	Pin	Assignment / Signal
X5 / NC	27	No internal connection
X5 / 3.0	28	DC532 / C16
X5 / 3.1	29	DC532 / C17
X5 / 3.2	30	DC532 / C18
X5 / 3.3	31	DC532 / C19
X5 / 3.4	32	DC532 / C20
X5 / 3.5	33	DC532 / C21
X5 / 3.6	34	DC532 / C22
X5 / 3.7	35	DC532 / C23

Table 139: Pin assignment DC (X6)

Connector / Terminal	Pin	Assignment / Signal
X6 / 4.0	36	DC532 / C24
X6 / 4.1	37	DC532 / C25
X6 / 4.2	38	DC532 / C26
X6 / 4.3	39	DC532 / C27
X6 / 4.4	40	DC532 / C28
X6 / 4.5	41	DC532 / C29
X6 / 4.6	42	DC532 / C30
X6 / 4.7	43	DC532 / C31
X6 / NC	44	No internal connection

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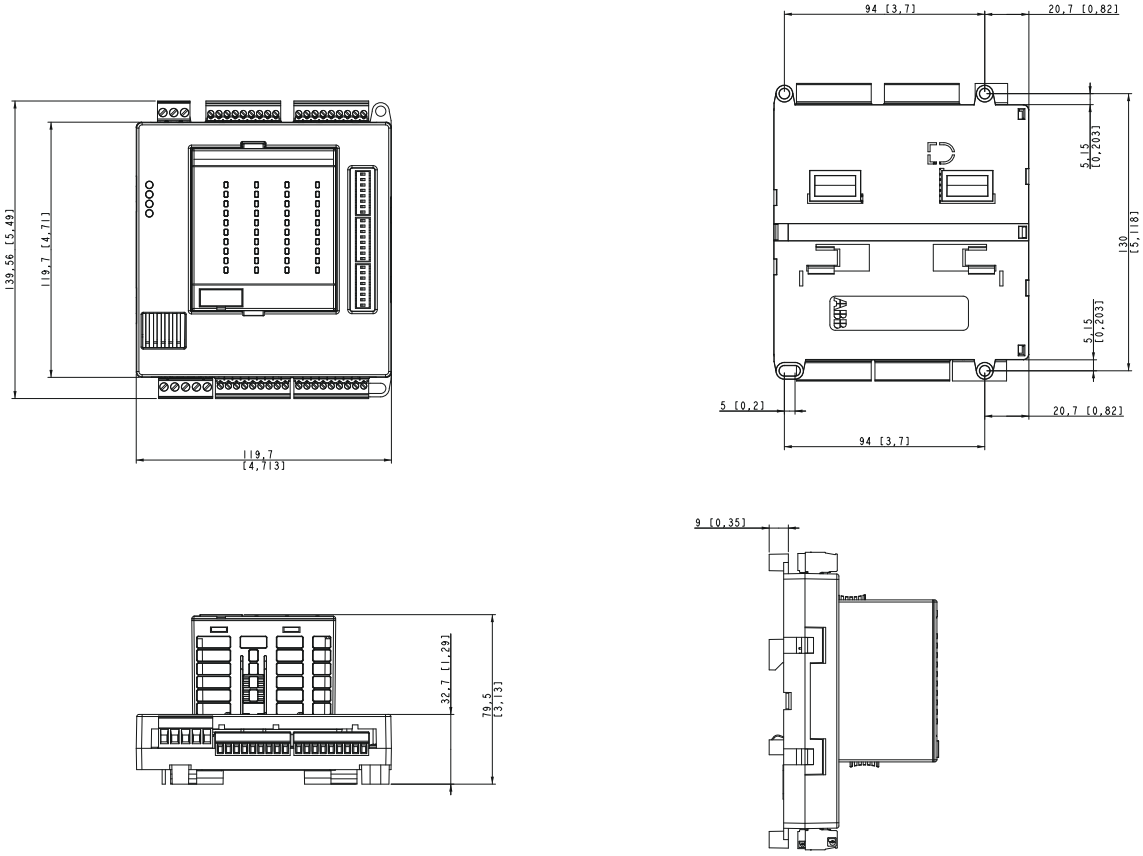
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

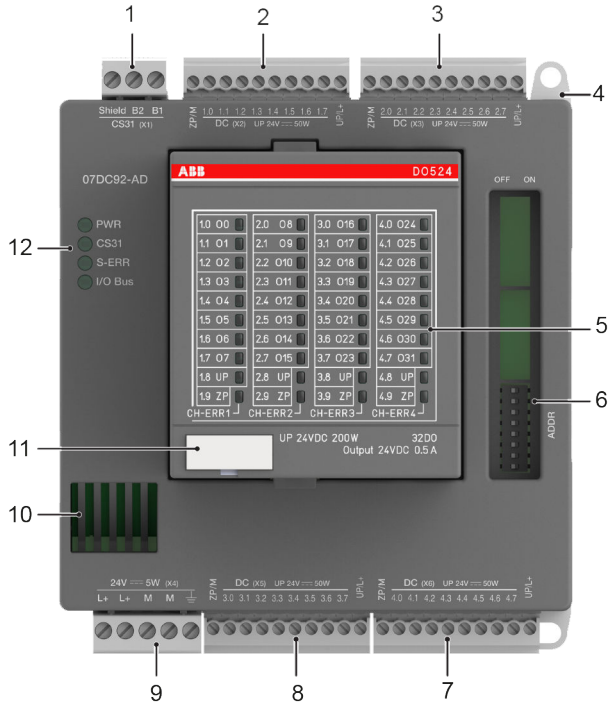
- Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
- Only by qualified personnel.

151.1 Dimensions



The dimensions are in mm and in brackets in inch.

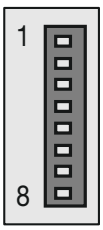
151.2 Connections



1 Connector X1: CS31 bus
2 Connector X2: 8 DC + voltage supply (incl. DO524)
3 Connector X3: 8 DC + voltage supply (incl. DO524)
4 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
5 Status LEDs for DO524
6 DIP switch for address setting (ADDR)
7 Connector X6: 8 DC + voltage supply (incl. DO524)
8 Connector X5: 8 DC + voltage supply (incl. DO524)
9 Connector X4: Voltage supply (incl. DO524)
10 Ventilation
11 TA525: Label
12 4 LEDs to display the status of the complete 07DC92-AD device

All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

151.2.1 DIP switch for ADDR

	Switcher number	ON	OFF
	S1	32 DO	32 DC
	S2	ADDR: 32	0
	S3	ADDR: 16	0
	S4	ADDR: 8	0
	S5	ADDR: 4	0
	S6	ADDR: 2	0

	Switcher number	ON	OFF
	S7	ADDR: 1	0
	S8	NC	NC

151.2.2 Plug connection

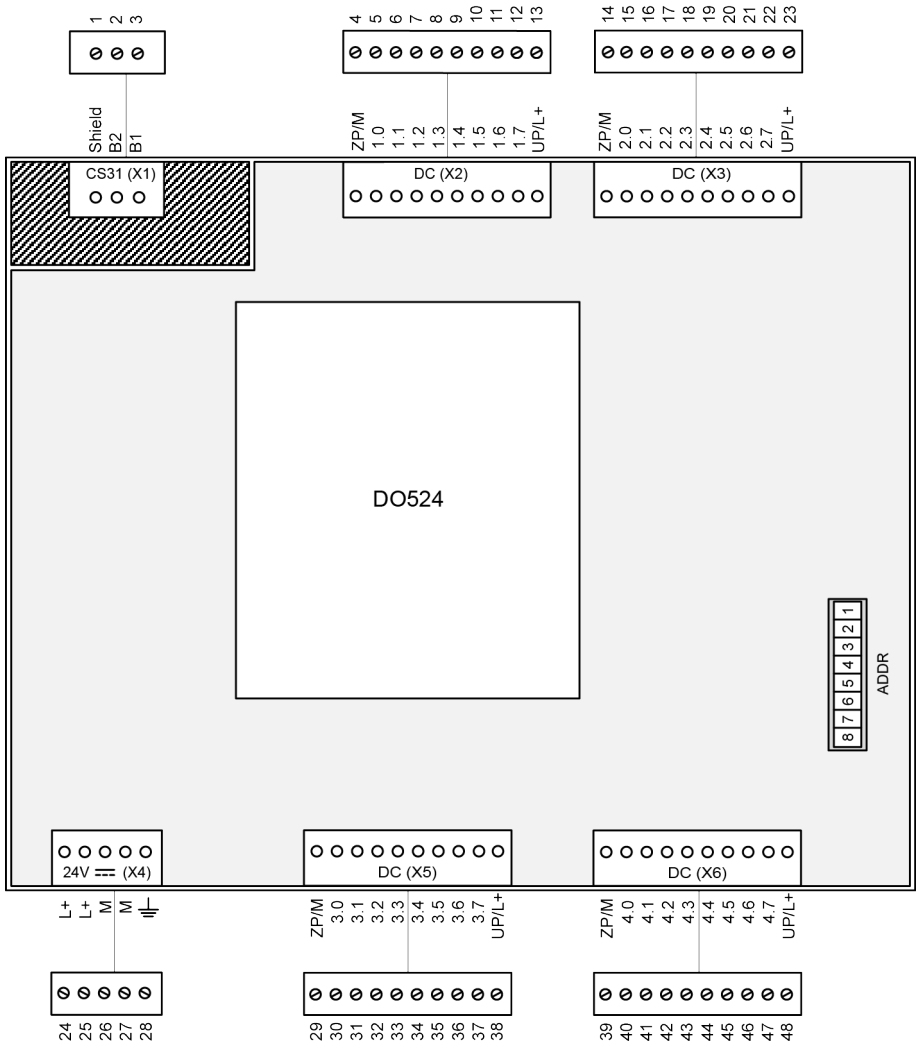


Table 140: Pin assignment CS31 bus (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / Shield	1	No internal connection
X1 / B2	2	BUS 2
X1 / B1	3	BUS 1

Table 141: Pin assignment DC (X2)

Connector / Terminal	Pin	Assignment / Signal
X2 / ZP/M	4	ZP/M
X2 / 1.0	5	DO524 / O0

Connector / Terminal	Pin	Assignment / Signal
X2 / 1.1	6	DO524 / O1
X2 / 1.2	7	DO524 / O2
X2 / 1.3	8	DO524 / O3
X2 / 1.4	9	DO524 / O4
X2 / 1.5	10	DO524 / O5
X2 / 1.6	11	DO524 / O6
X2 / 1.7	12	DO524 / O7
X2 / UP/L+	13	UP/L+

Table 142: Pin assignment DC (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / ZP/M	14	ZP/M
X3 / 2.0	15	DO524 / O8
X3 / 2.1	16	DO524 / O9
X3 / 2.2	17	DO524 / O10
X3 / 2.3	18	DO524 / O11
X3 / 2.4	19	DO524 / O12
X3 / 2.5	20	DO524 / O13
X3 / 2.6	21	DO524 / O14
X3 / 2.7	22	DO524 / O15
X3 / UP/L+	23	UP/L+

Table 143: Pin assignment 24 V DC (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / L+	24	L+
X4 / L+	25	L+
X4 / M	26	M
X4 / M	27	M
X4 / FE	28	FE

Table 144: Pin assignment DC (X5)

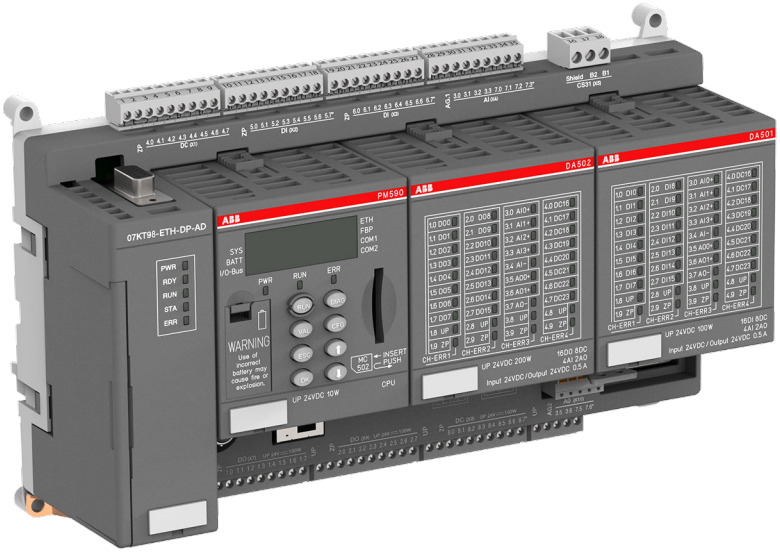
Connector / Terminal	Pin	Assignment / Signal
X5 / ZP/M	29	ZP/M
X5 / 3.0	30	DO524 / O16
X5 / 3.1	31	DO524 / O17
X5 / 3.2	32	DO524 / O18
X5 / 3.3	33	DO524 / O19
X5 / 3.4	34	DO524 / O20
X5 / 3.5	35	DO524 / O21
X5 / 3.6	36	DO524 / O22
X5 / 3.7	37	DO524 / O23
X5 / UP/L+	38	UP/L+

Table 145: Pin assignment DC (X6)

Connector / Terminal	Pin	Assignment / Signal
X6 / ZP/M	39	ZP/M
X6 / 4.0	40	DO524 / O24
X6 / 4.1	41	DO524 / O25
X6 / 4.2	42	DO524 / O26
X6 / 4.3	43	DO524 / O27
X6 / 4.4	44	DO524 / O28
X6 / 4.5	45	DO524 / O29
X6 / 4.6	46	DO524 / O30
X6 / 4.7	47	DO524 / O31
X6 / UP/L+	48	UP/L+

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- 07KT9x-AD



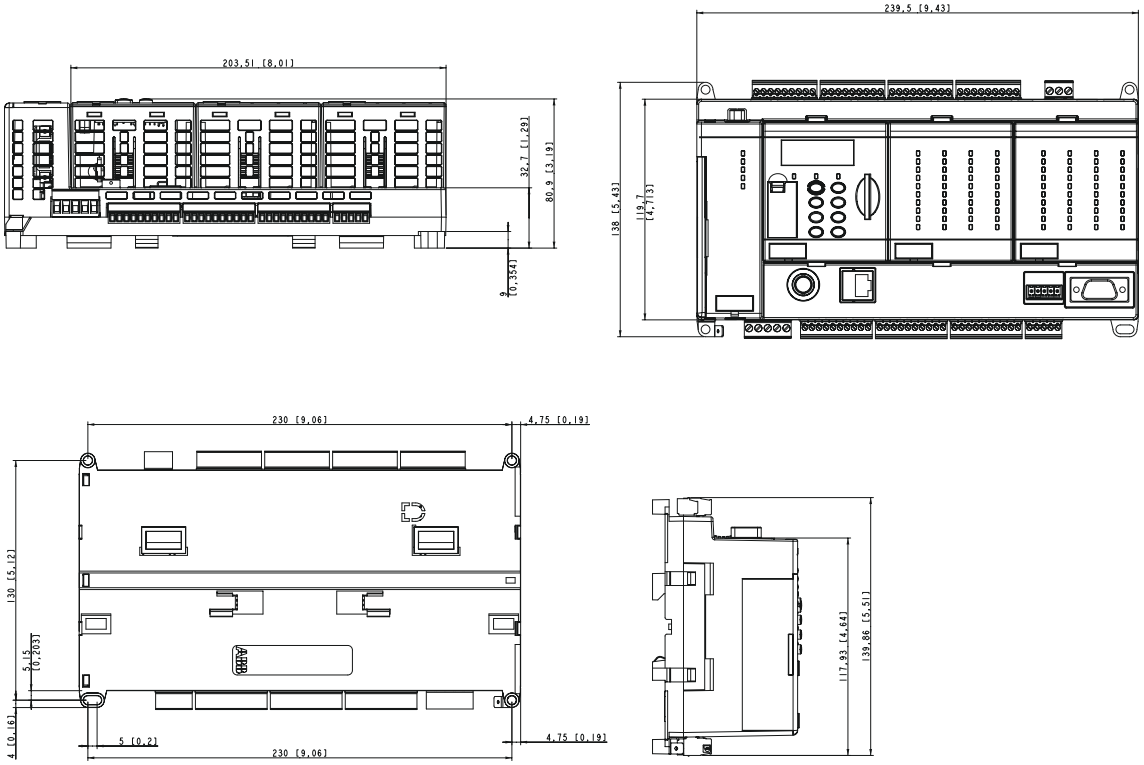
CAUTION!

Risk of injury and damaging the product!

Improper installation and maintenance may result in injury and can damage the product!

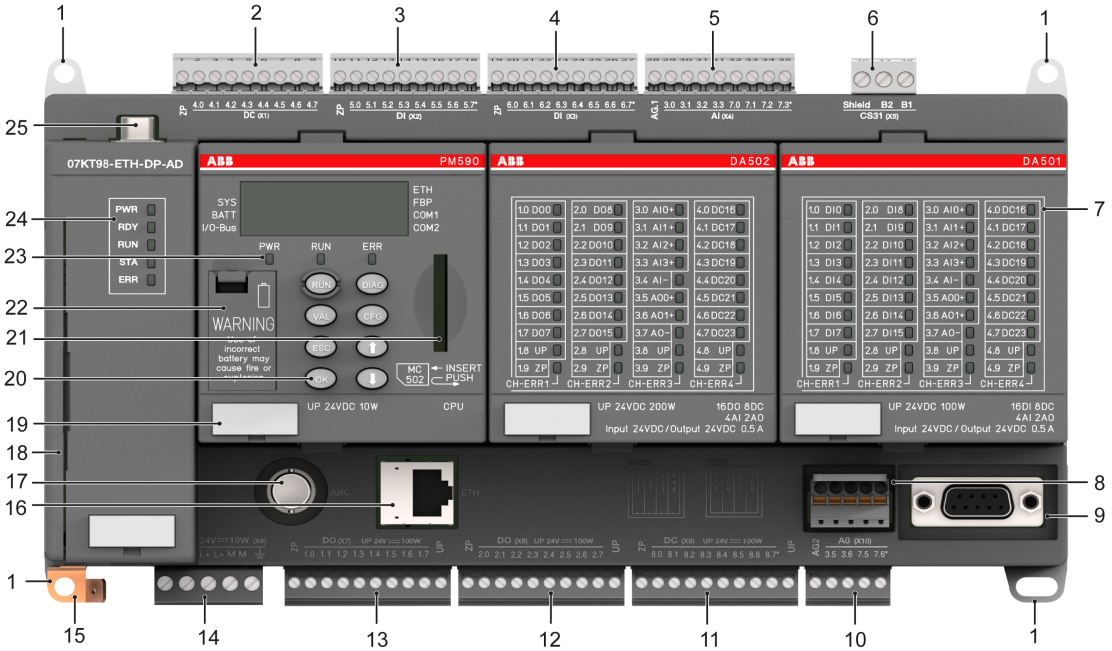
– Installation and maintenance have to be performed according to the technical rules, codes and relevant standards, e.g. EN 60204-1.
– Only by qualified personnel.

152.1 Dimensions



The dimensions are in mm and in brackets in inch.

152.2 Connections

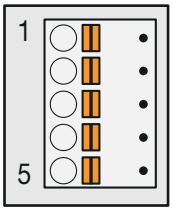


1 Hole for screw mounting (screw diameter 4 mm, extension torque 1.2 Nm)
2 Digital inputs/outputs for DA502

3 Digital inputs for DA501
4 Digital inputs for DA501
5 Analog inputs for DA501/DA502
6 CS31 bus Interface
7 Status LEDs for DA501/DA502
8 DIAG: Serial interface (diagnosis)
9 COM2: Serial interface (thread UNC 4-40)
10 Analog outputs for DA501/DA502. ± 10 V, 0 mA ... 20 mA, 4 mA ... 20 mA in one group
11 Digital inputs/outputs for DA501
12 Digital outputs for DA502
13 Digital outputs for DA502
14 Supply voltage connection 24 V DC (CPU and communication module)
15 Ground connection (FE). Connection for 6.3 mm Faston.
16 Ethernet: Network interface (function depends on device version)
17 Interface for ARCNET (BNC)
18 External network interface
19 TA525: Label
20 8 operating buttons
21 Memory card
22 Compartment for primary lithium cell TA521 ot battery holder TA522
23 3 system LEDs
24 5 status LEDs (only for PROFIBUS)
25 Connection for PROFIBUS (optional) (function depends on device version)

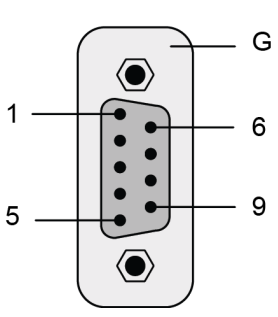
All I/O channels (digital and analog) are protected against reverse polarity, reverse supply and temporary overvoltage up to 30 VDC.

152.2.1 Diagnosis connector



PIN	Signal	Description
1	NC	Not connected
2	TX	Transmit data
3	M	M
4	RX	Receive data
5	FE	FE

152.2.2 Serial interface COM2

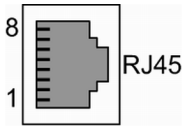


PIN	Signal	Description
G	Housing	FE
1	FE	FE (shield)
2	TxD	Transmit data (output)
3	RxD	Receive data (input)
4	RTS	Request to send (output)
5	CTS	Clear to send (input)
6	NC	-

	PIN	Signal	Description
	7	SGND	Signal ground (SGND)
	8	0 V out	-
	9	+5 V out	Reserved

152.2.3 Ethernet network interface

Pin assignment

	PIN	Signal	Description
	1	TxD+	Transmit data +
	2	TxD-	Transmit data -
	3	RxD+	Receive data +
	4	NU	Not used
	5	NU	Not used
	6	RxD-	Receive data -
	7	NU	Not used
	8	NU	Not used
	Shield	Cable shield	Functional earth

NOTICE!

Risk of corrosion!

Unused connectors and slots may corrode if XC devices are used in salt-mist environments.

Protect unused connectors and slots with TA535 protective caps for XC devices.

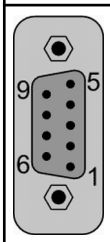
152.2.4 ARCNET



ARCNET BNC

152.2.5 PROFIBUS interface

Pin Assignment

	Pin	Signal	Description
	1	NC	Not connected
	2	NC	Not connected
	3	RxD/TxD-P	Receive/Transmit positive
	4	CNTR-P	Control signal for repeater, positive
	5	DGND	Reference potential for data exchange and +5 V

	Pin	Signal	Description
	6	VP	+5 V (power supply for the bus terminating resistors)
	7	NC	Not connected
	8	RxD/TxD-N	Receive/Transmit negative
	9	NC	Not connected

In corrosive environment, please protect unused connectors using the TA535 accessory.

Not supplied with this device.

152.2.6 Plug connection

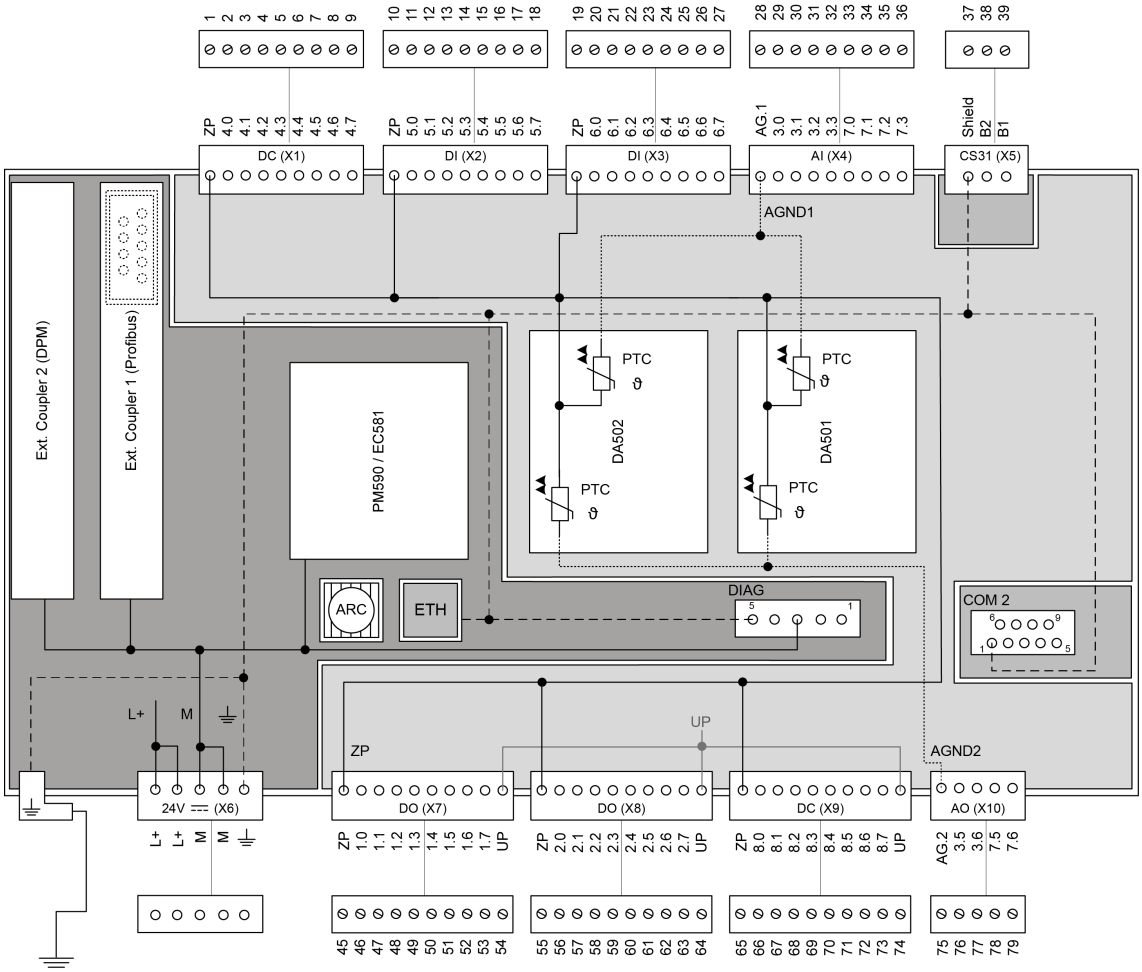


Table 146: Connector (X1)

Connector / Terminal	Pin	Assignment / Signal
X1 / ZP	1	ZP
X1 / 4.0	2	DA502 / DC16
X1 / 4.1	3	DA502 / DC17
X1 / 4.2	4	DA502 / DC18

Connector / Terminal	Pin	Assignment / Signal
X1 / 4.3	5	DA502 / DC19
X1 / 4.4	6	DA502 / DC20
X1 / 4.5	7	DA502 / DC21
X1 / 4.6	8	DA502 / DC22
X1 / 4.7	9	DA502 / DC23

Table 147: Connector X2

Connector / Terminal	Pin	Assignment / Signal
X2 / ZP	10	ZP
X2 / 5.0	11	DA501 / DI0
X2 / 5.1	12	DA501 / DI1
X2 / 5.2	13	DA501 / DI2
X2 / 5.3	14	DA501 / DI3
X2 / 5.4	15	DA501 / DI4
X2 / 5.5	16	DA501 / DI5
X2 / 5.6	17	DA501 / DI6
X2 / 5.7	18	DA501 / DI7

Table 148: Connector (X3)

Connector / Terminal	Pin	Assignment / Signal
X3 / ZP	19	ZP
X3 / 6.0	20	DA501 / DI8
X3 / 6.1	21	DA501 / DI9
X3 / 6.2	22	DA501 / DI10
X3 / 6.3	23	DA501 / DI11
X3 / 6.4	24	DA501 / DI12
X3 / 6.5	25	DA501 / DI13
X3 / 6.6	26	DA501 / DI14
X3 / 6.7	27	DA501 / DI15

Table 149: Connector (X4)

Connector / Terminal	Pin	Assignment / Signal
X4 / AG.1	28	AGND1
X4 / 3.0	29	DA502 / AI0+
X4 / 3.1	30	DA502 / AI1+
X4 / 3.2	31	DA502 / AI2+
X4 / 3.3	32	DA502 / AI3+
X4 / 7.0	33	DA501 / AI0+
X4 / 7.1	34	DA501 / AI1+

Connector / Terminal	Pin	Assignment / Signal
X4 / 7.2	35	DA501 / AI2+
X4 / 7.3	36	DA501 / AI3+

To be able to use the analog inputs, UP must be connected. L+/M and UP/ZP must always be supplied with voltage.

Table 150: Connector (X5)

Connector / Terminal	Pin	Assignment / Signal
X5 / shield	37	Shield (functional earth)
X5 / B2	38	BUS2
X5 / B1	39	BUS1

Terminal "Shield" is internally connected to FE. The previous grounding measures, e.g. with clip at the control cabinet, are still required.

If 07KT9x-AD is connected to one of the bus ends, a 120 Ω resistor must be connected for bus termination. The device 07KT9x-AD always functions as master. Slave operation is not possible. Further information on CS31 bus.

Table 151: Connector (X6)

Connector / Terminal	Pin	Assignment / Signal
X6 / L+	40	Supply voltage +24 V DC
X6 / L+	41	Supply voltage +24 V DC
X6 / M	42	Ground connection (0 V)
X6 / M	43	Ground connection (0 V)
X6 / functional earth	44	The functional earth (FE) is connected to the Faston terminal inside the device. Ensure that no ground loops are created and that FE and Faston are connected to the same ground potential.

NOTICE!

- In addition to connecting the supply voltage (L+/M) to X6, the supply voltage (UP/ZP) must be connected to all connectors.
- ZP must be connected to all connectors (X1, X2, X3, X7, X8, X9).
- UP must be connected to all connectors (X7, X8, X9).
- L+/M and UP/ZP must always be supplied with voltage.

Table 152: Connector (X7)

Connector / Terminal	Pin	Assignment / Signal
X7 / ZP	45	ZP
X7 / 1.0	46	DA502 / DO0

Connector / Terminal	Pin	Assignment / Signal
X7 / 1.1	47	DA502 / DO1
X7 / 1.2	48	DA502 / DO2
X7 / 1.3	49	DA502 / DO3
X7 / 1.4	50	DA502 / DO4
X7 / 1.5	51	DA502 / DO5
X7 / 1.6	52	DA502 / DO6
X7 / 1.7	53	DA502 / DO7
X7 / UP	54	UP

Table 153: Connector (X8)

Connector / Terminal	Pin	Assignment / Signal
X8 / ZP	55	ZP
X8 / 2.0	56	DA502 / DO8
X8 / 2.1	57	DA502 / DO9
X8 / 2.2	58	DA502 / DO10
X8 / 2.3	59	DA502 / DO11
X8 / 2.4	60	DA502 / DO12
X8 / 2.5	61	DA502 / DO13
X8 / 2.6	62	DA502 / DO14
X8 / 2.7	63	DA502 / DO15
X8 / UP	64	UP

Table 154: Connector (X9)

Connector / Terminal	Pin	Assignment / Signal
X9 / ZP	65	ZP
X9 / 8.0	66	DA501 / DC16
X9 / 8.1	67	DA501 / DC17
X9 / 8.2	68	DA501 / DC18
X9 / 8.3	69	DA501 / DC19
X9 / 8.4	70	DA501 / DC20
X9 / 8.5	71	DA501 / DC21
X9 / 8.6	72	DA501 / DC22
X9 / 8.7	73	DA501 / DC23
X9 / UP	74	UP

Connector / Terminal	Pin	Assignment / Signal
X10 / AG.2	75	AGND2
X10 / 3.5	76	DA502 / AO0+
X10 / 3.6	77	DA502 / AO1+

Connector / Terminal	Pin	Assignment / Signal
X10 / 7.5	78	DA501 / AO0+
X10 / 7.6	79	DA501 / AO1+

UP must be connected to connectors X7, X8 and X9. The internal voltage supply to the ADC channels is no longer provided by L+ but by UP in the modules DA501 and DA502.



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