SIEMENS

PROFIBUS bus connector

Equipment Manual

06/2022

A5E50543113-AB

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens AG
Digital Industries
Postfach 48 48
90026 NÜRNBERG
GERMANY

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Introduction

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1.1 Preface

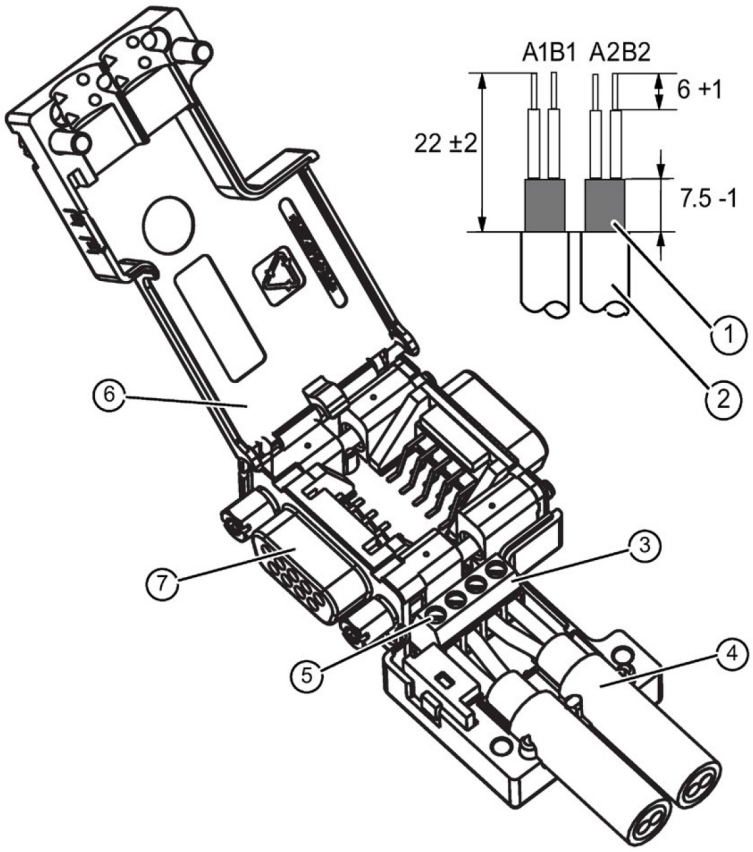
Purpose of the documentation

This equipment manual contains a compact description of the module-specific information on the following devices:

Device	**Article number**
PROFIBUS bus connector plug with/without PG socket up to 12 Mbaud	6ES7972-0BA12-0XA0 6ES7972-0BB12-0XA0
PROFIBUS bus connector plug up to 1.5 MBaud	6ES7972-0BA30-0XA0
PROFIBUS bus connector plug with/without PG socket up to 12 Mbaud	6ES7972-0BA42-0XA0 6ES7972-0BB42-0XA0
PROFIBUS FastConnect bus connector with/without PG socket up to 12 Mbaud	6ES7972-0BA52-0XA0 6ES7972-0BB52-0XA0
PROFIBUS FastConnect bus connector with/without PG socket up to 12 Mbaud	6ES7972-0BA61-0XA0 6ES7972-0BB61-0XA0
PROFIBUS FastConnect bus connector with/without PG socket up to 12 Mbaud	6ES7972-0BA70-0XA0 6ES7972-0BB70-0XA0

The system-related functions are described in the respective system manuals. All system-spanning functions are described in the function manuals.

Bus cable assembly



No.	Description
1	Cable shield
2	Bus cable (e.g. 6XV1 830-0EH10) - strip insulation, e.g. with stripping tool 6GK1905-6AA00
3	Screw terminal block on connector board for bus cable connection. - Insert green and red wire into screw terminal block (A1, B1 or A2, B2) (Recommendation: A = green, B = red)
4	Press cable between the two terminal blocks. Cable shield must be stripped on contact element.
5	Screw the green and red wires tightly into the screw terminal.
6	Close the enclosure cover and screw it tight.
7	PG socket (only for 6ES7972-0BB12-0XA0)

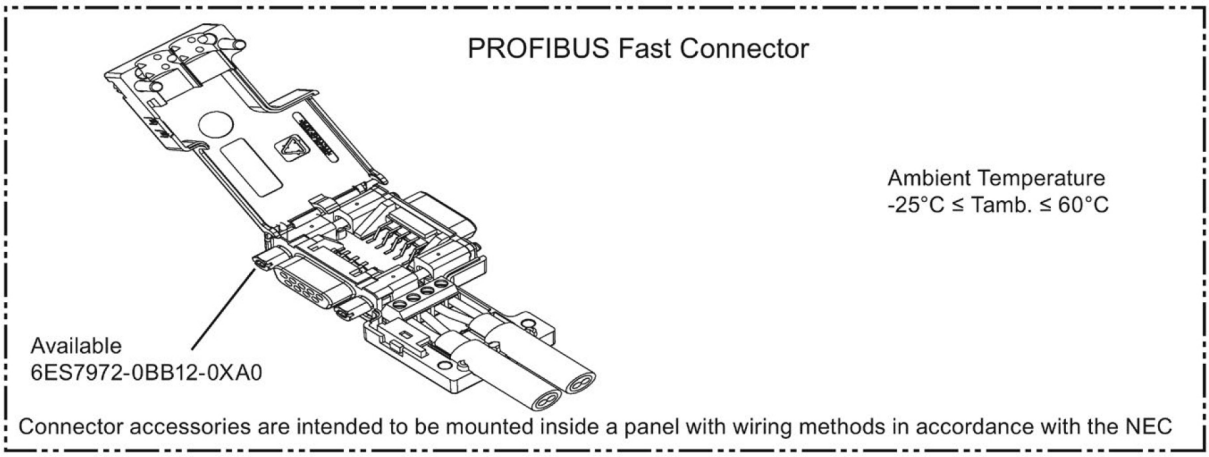
Note

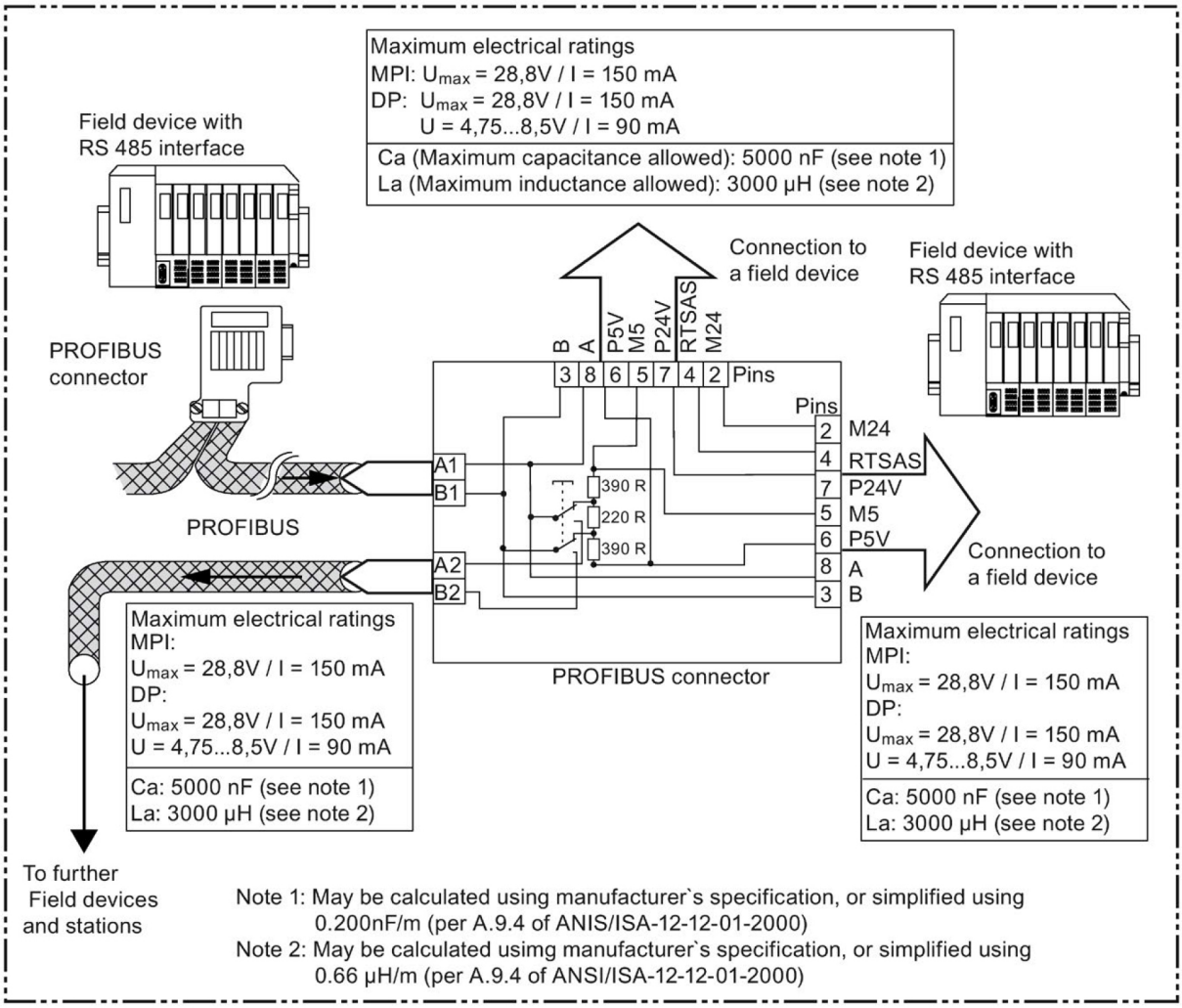
If the switch is set to ON, the PROFIBUS to the other stations is disconnected at this point (e.g. for service purposes).

Bus connection for the first and last station on the PROFIBUS

Cable must always be connected on the left (see marking A1, B1), switch position must be "ON" for the first and last station on the PROFIBUS. (terminating resistor switched on).

Connection


PROFIBUS Fast Connector
Ambient Temperature
-25°C ≤ Tamb. ≤ 60°C
Available
6ES7972-0BB12-0XA0
Connector accessories are intended to be mounted inside a panel with wiring methods in accordance with the NEC


Maximum electrical ratings
MPI: Umax = 28,8V / I = 150 mA
DP: Umax = 28,8V / I = 150 mA
U = 4,75...8,5V / I = 90 mA
Ca (Maximum capacitance allowed): 5000 nF (see note 1)
La (Maximum inductance allowed): 3000 µH (see note 2)
Field device with RS 485 interface
Connection to a field device
Field device with RS 485 interface
PROFIBUS connector
B A P5V M5 P24V RTSAS M24
3 8 6 5 7 4 2 Pins
Pins
2 M24
4 RTSAS
7 P24V
5 M5
6 P5V
8 A
3 B
A1
B1
390 R
220 R
390 R
PROFIBUS
A2
B2
Connection to a field device
Maximum electrical ratings
MPI:
Umax = 28,8V / I = 150 mA
DP:
Umax = 28,8V / I = 150 mA
U = 4,75...8,5V / I = 90 mA
Ca: 5000 nF (see note 1)
La: 3000 µH (see note 2)
PROFIBUS connector
Maximum electrical ratings
MPI:
Umax = 28,8V / I = 150 mA
DP:
Umax = 28,8V / I = 150 mA
U = 4,75...8,5V / I = 90 mA
Ca: 5000 nF (see note 1)
La: 3000 µH (see note 2)
To further Field devices and stations
Note 1: May be calculated using manufacturer`s specification, or simplified using 0.200nF/m (per A.9.4 of ANIS/ISA-12-12-01-2000)
Note 2: May be calculated usimg manufacturer`s specification, or simplified using 0.66 µH/m (per A.9.4 of ANSI/ISA-12-12-01-2000)

Approvals

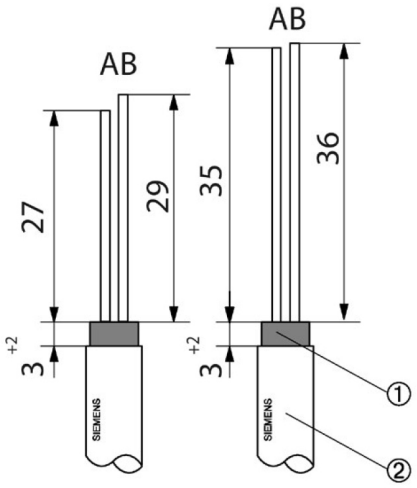
You can find information on the approvals under Standards, approvals and safety notes (Page 29).

Module-specific data

You can find information under Module-specific data (Page 37).

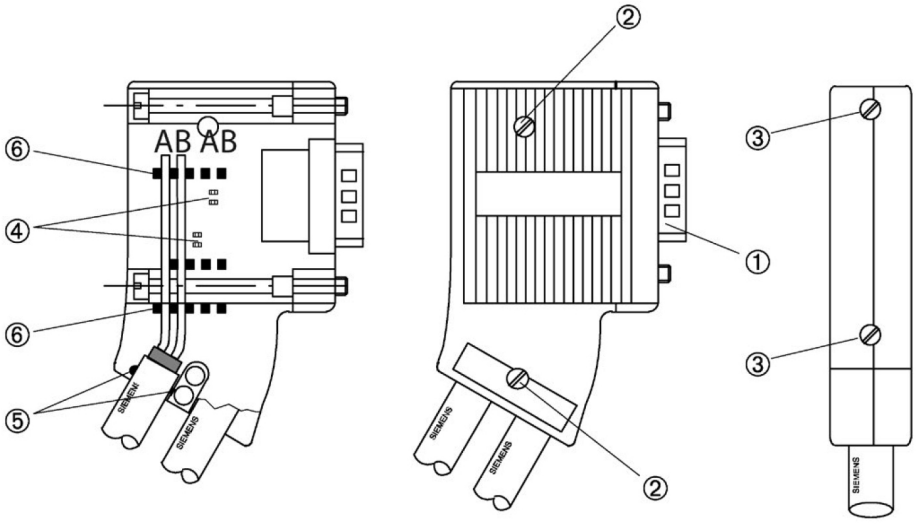
3.2 6ES7972-0BA30-0XA0

The following provides you with product information about the PROFIBUS bus connector 6ES7 972-0BA30-0XA0:



No.	Description
1	Cable shield
2	Bus cable, 6XV1 830-0AH10

Bus connection for the stations on the PROFIBUS where no terminating resistor is connected.



No.	Description
1	9-pin D-sub connector for connection at the station (pin 3 and 8 allocated)
2	Housing screws
3	Screws for fastening to the station
4	Insulation displacement terminals for bus cable connection
5	Strain relief
6	Guides

Mounting the bus cable

1. Strip the insulation from the bus cable as shown in Fig. 1.
2. Open the casing of the bus connector by undoing the screws ②
   and removing the cover.
3. Press the bus cable into the strain relief ⑤
   (cable shield must be bare on the metal guide).
4. Place the wires in the guides ⑥ over the insulation displacement terminals ④.
   Ensure that the same wires are always connected to the same connection A or B
   (always wire connection A with green wire and connection B
   with red wire).
5. Press the red and green wires lightly into the insulation displacement terminals with your thumb.
6. Screw the cover back on tightly.

Note

Connection of the bus lines

The bus lines are connected using an insulation displacement system (Fast Connect). The insulation displacement terminals are designed for 3 connection cycles. If you want to reconnect a line that has already been connected, you must first cut it off.

Approvals

You can find information on the approvals under Standards, approvals and safety notes (Page 29).

Module-specific data

You can find information under Module-specific data (Page 37).

3.3 6ES7972-0Bx42-0XA0

The following provides you with product information about the PROFIBUS bus connector with/without PG socket up to 12 MBaud 6ES7972-0Bx42-0XA0:

You can use the PROFIBUS bus connector to

- Connect stations with an electrical 9-pin D-sub interface according to IEC 61158-2 directly to the SIMATIC NET PROFIBUS lines.
- Electrical segments or individual stations can be connected to the Optical Link Module (OLM, OBT).
- Stations or programming devices are connected to the repeater.

More information

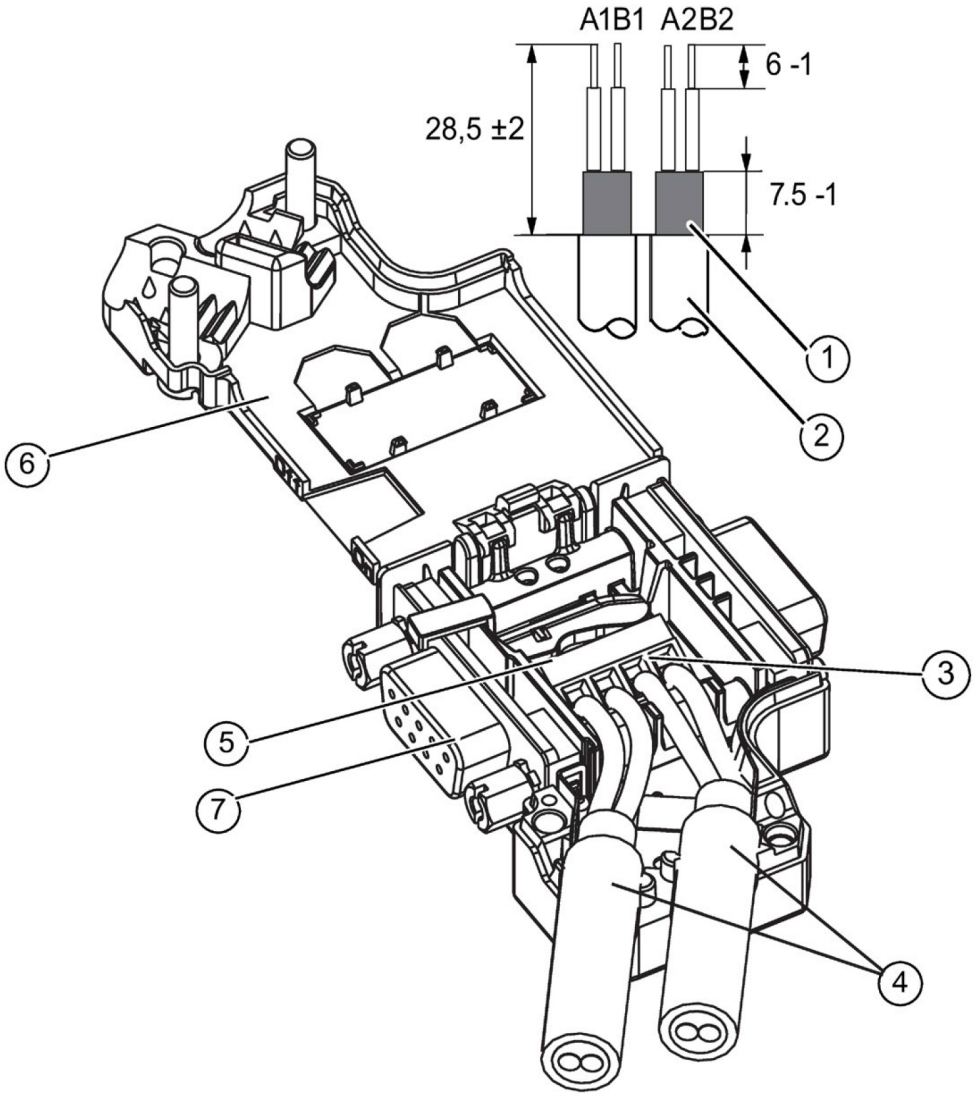
You can find more information about the PROFIBUS bus connector in the SIMATIC NET PROFIBUS manual. The manual can be obtained at the nearest offices of your Siemens representative or free of charge on the Internet at the following link (http://support.automation.siemens.com/WW/view/en/35222591).

Maintenance

The PROFIBUS bus connector requires no maintenance. In the event of a fault, contact your Siemens representative responsible for spare parts/repairs:

Services (https://support.industry.siemens.com/cs/ww/en/sc/2154)

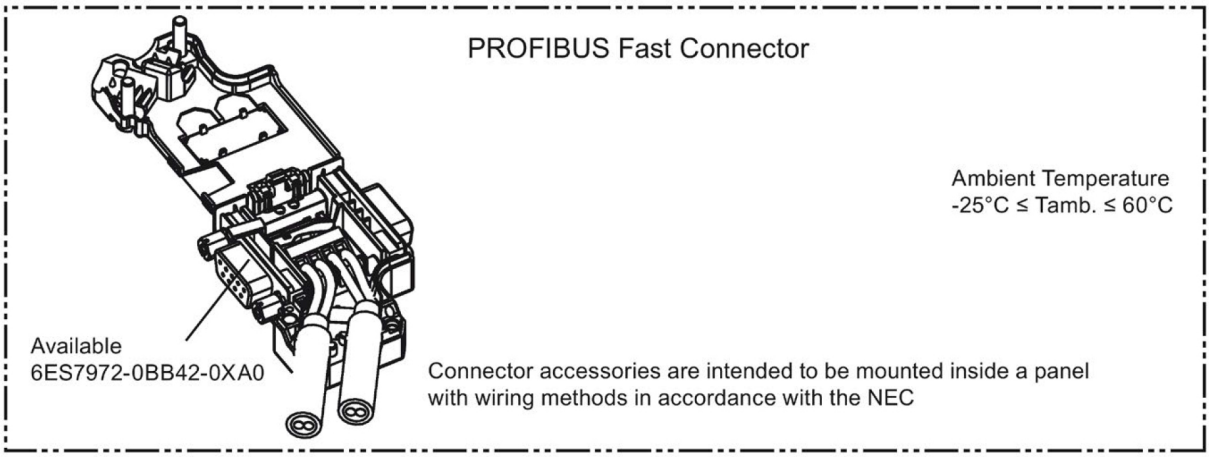
Bus cable assembly

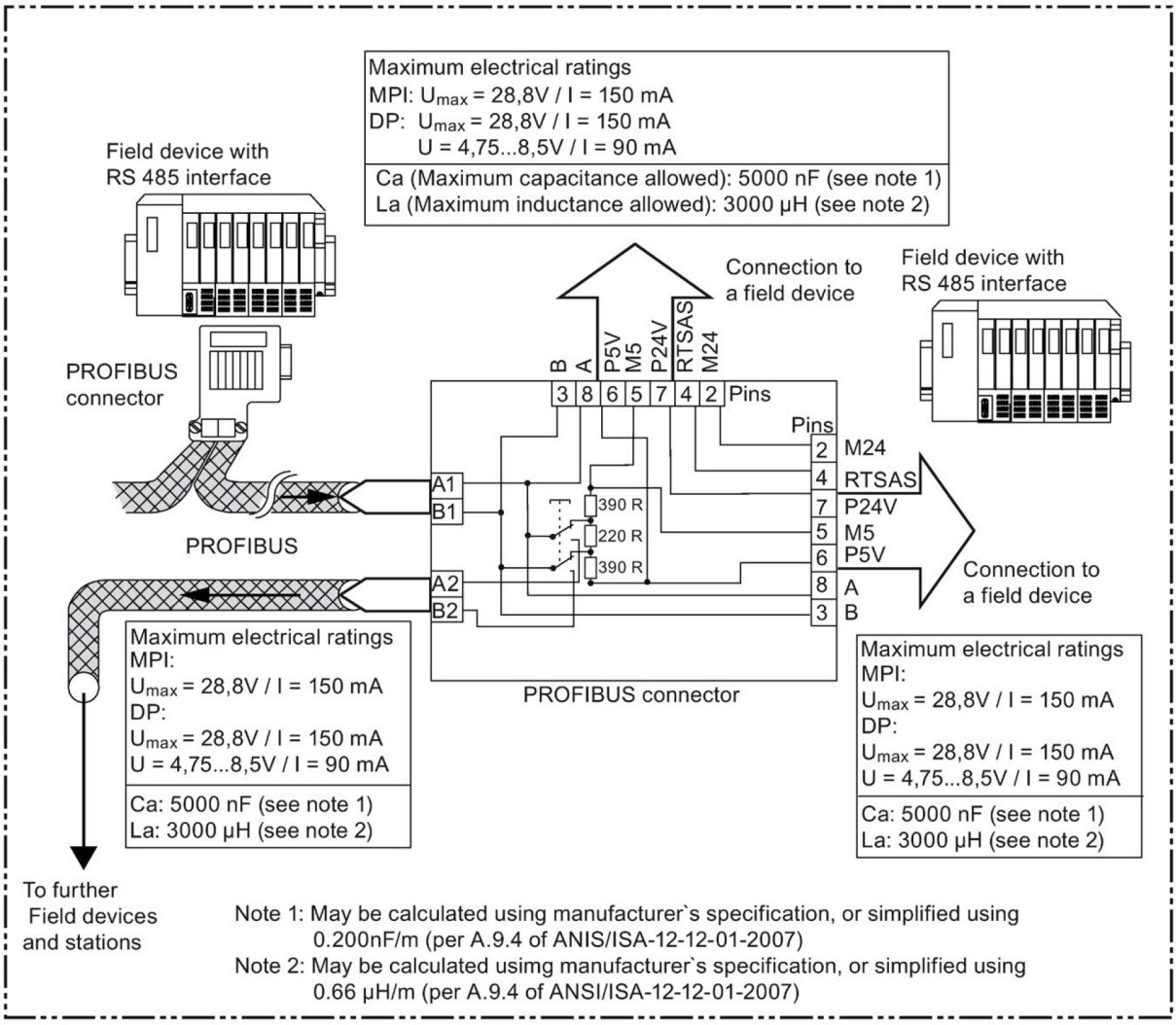


No.	Description
1	Cable shield
2	Bus cable (e.g. 6XV1 830-0EH10) - strip insulation, e.g. with stripping tool 6GK1905-6AA00
3	Screw terminal block on connector board for bus cable connection. - Insert green and red wire into screw terminal block (A1, B1 or A2, B2; (recommendation: A = green, B = red)
4	Press cable between the two terminal blocks. Cable shield must be stripped on contact element.
5	Screw the green and red wires tightly into the screw terminal.
6	Close the enclosure cover and screw it tight.
7	PG socket (only for 6ES7972-0BB42-0XA0)

Note

If the switch is set to ON, the PROFIBUS to the other stations is disconnected at this point (e.g. for service purposes).

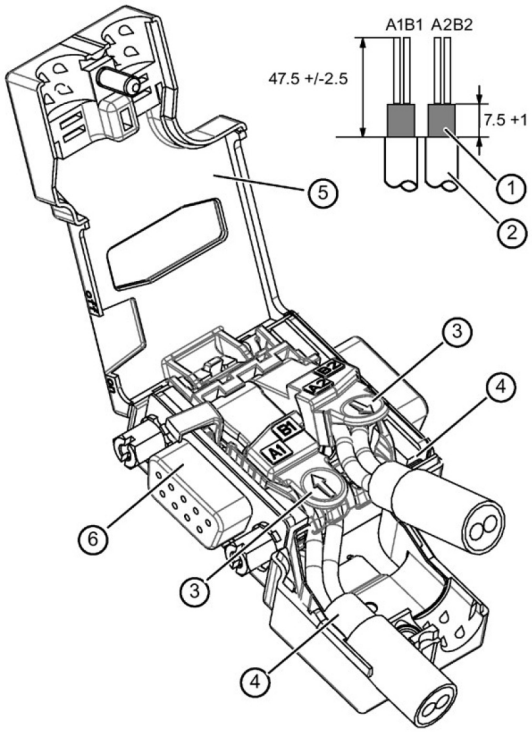




Approvals

You can find information on the approvals under Standards, approvals and safety notes (Page 29).

Bus cable assembly



No.	Description
1	Cable shield
2	Bus cable (e.g. 6XV1 830-0EH10) - strip insulation, e.g. with stripping tool 6GK1905-6AA00
3	Contact cover for insulation displacement terminal - Insert the green and red wires into the open contact cover as far as they will go. - Close the contact cover completely (press it down as far as it will go).
4	Press cable into recess (cable shield must be bare on contact element)
5	Close the enclosure cover and screw it tight.
6	PG socket (only for 6ES7972-0BB52-0XA0)

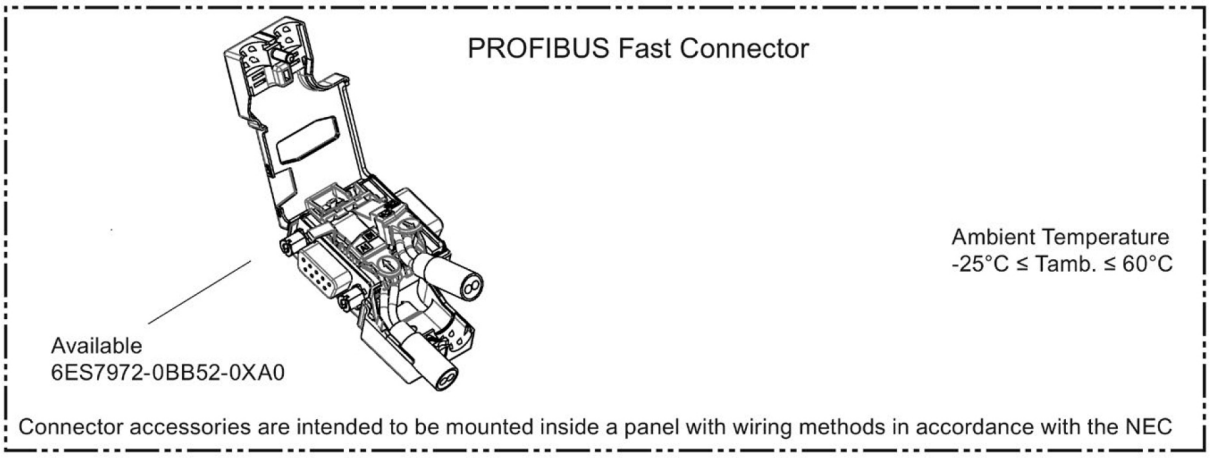
Note

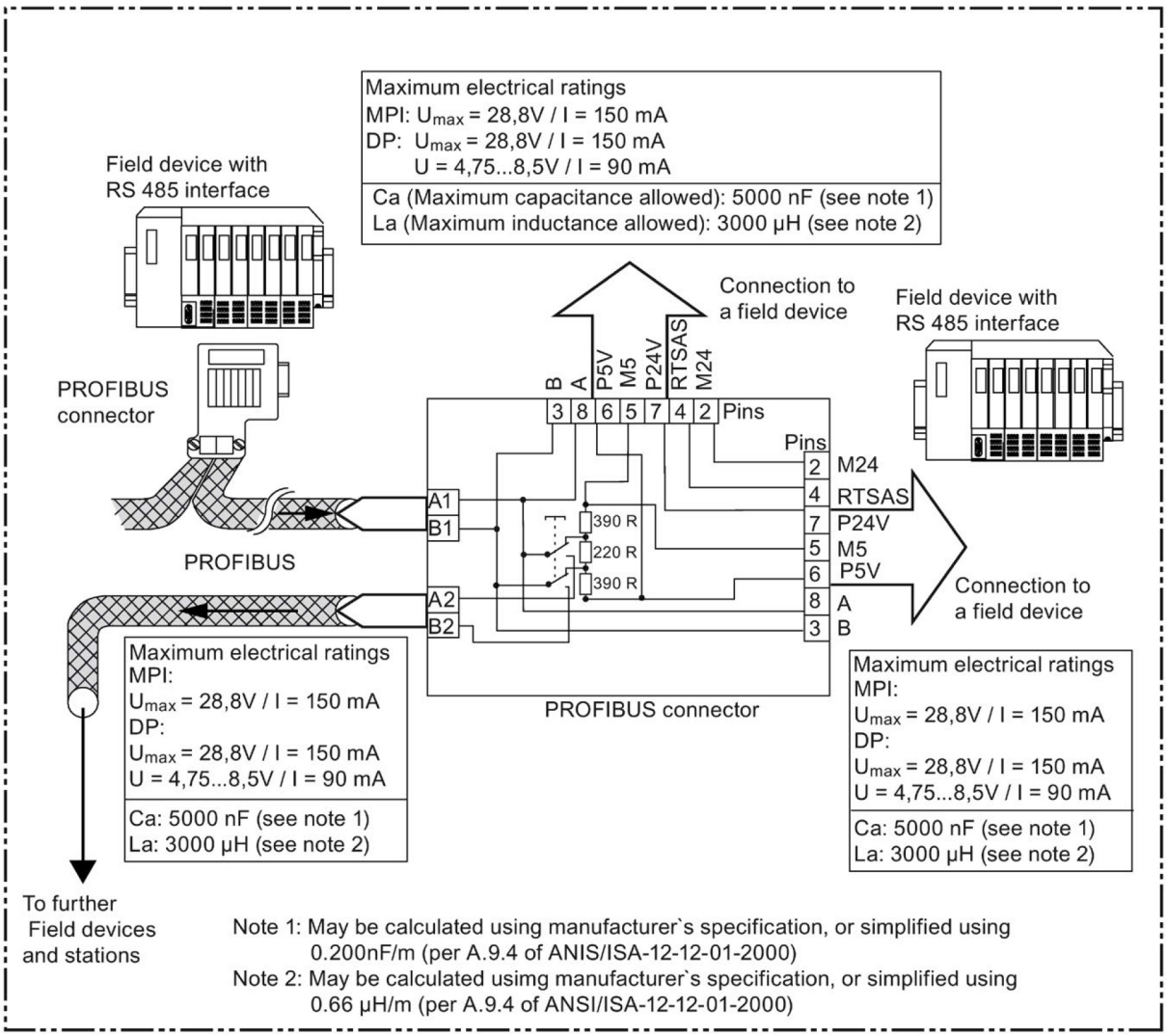
Connection of the bus lines

The bus lines are connected using an insulation displacement system (Fast Connect). The insulation displacement terminals are designed to withstand 10 terminating cycles. If you want to reconnect a line that has already been connected, you must first cut it off.

Note

If the switch is set to ON, the PROFIBUS to the other stations is disconnected at this point (e.g. for service purposes).

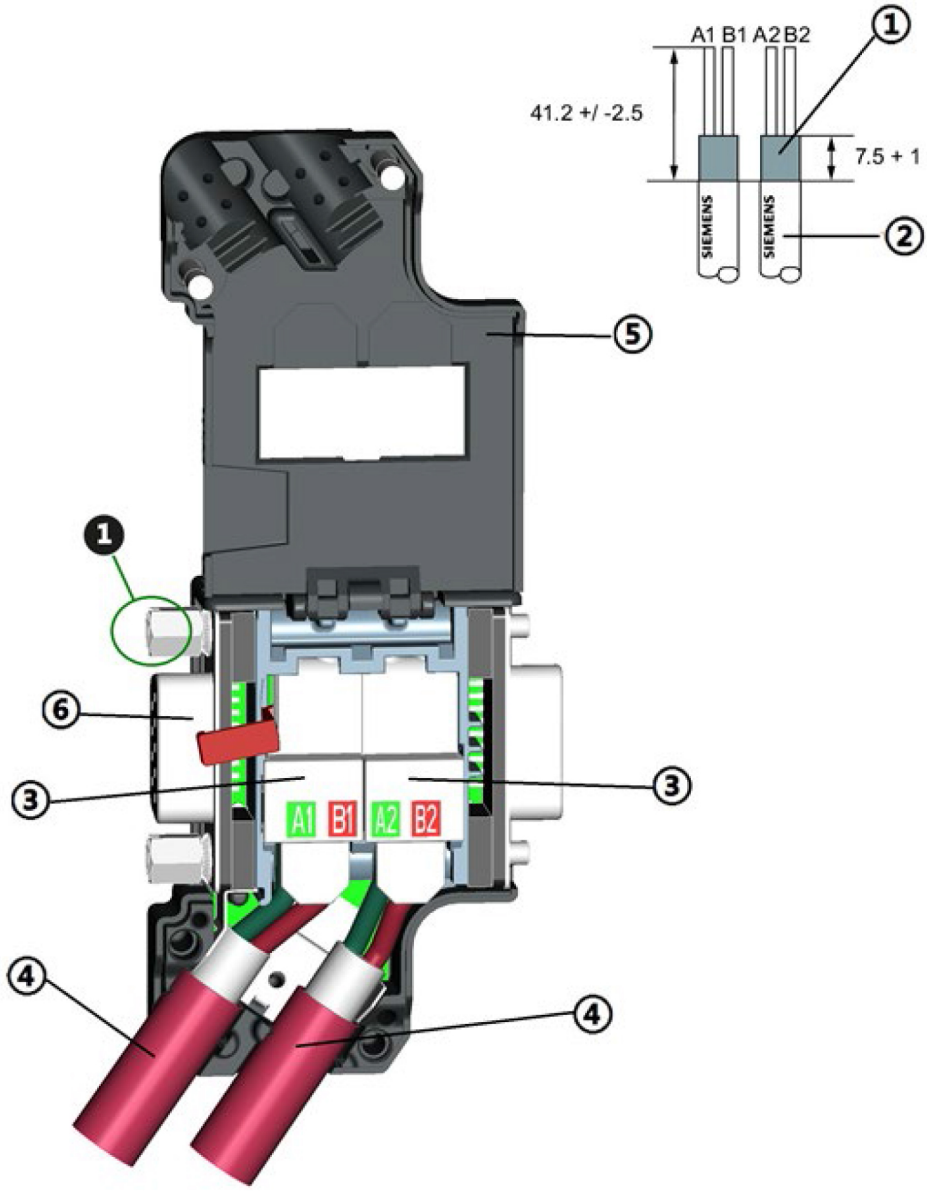




Approvals

Standards, approvals and safety notes (Page 29)

Bus cable assembly



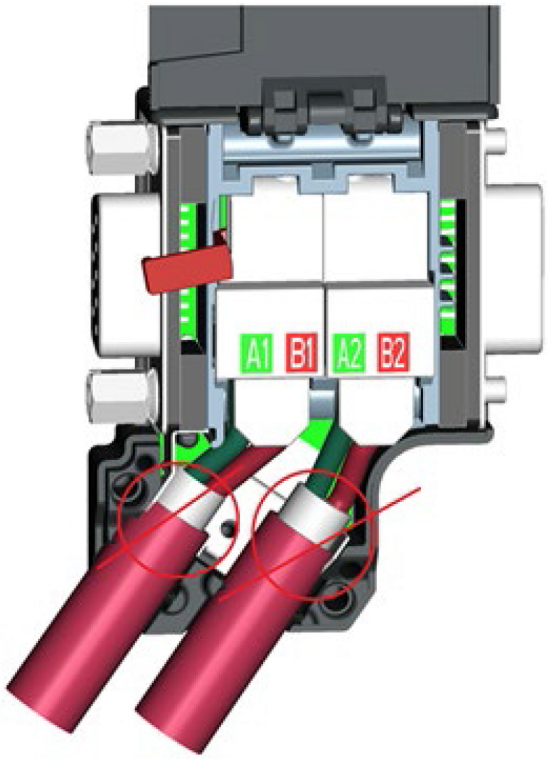
No.	Description
1	Cable shield
2	Bus cable (e.g. 6XV1 830-0EH10) - strip insulation, e.g. with stripping tool 6GK1905-6AA00
3	Contact cover for insulation displacement terminal - Insert the green and red wires into the open contact cover as far as they will go. - Close the contact cover completely (press it down as far as it will go).
4	Press cable into recess (cable sheath must not rest on the shield plate)
5	Close the enclosure cover and screw it tight.
6	PG socket (only for 6ES7972-0BB61-0XA0)

Note

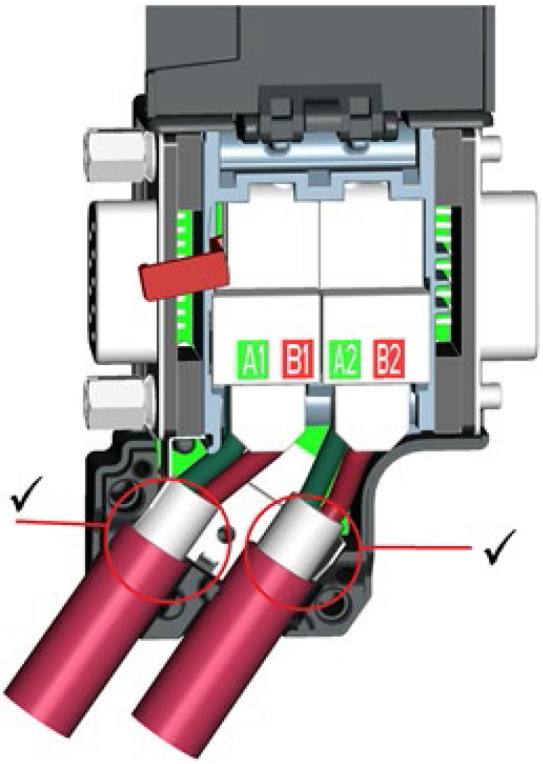
The tightening torque of the locking screws (marked in the figure) must not exceed 0.3Nm.

Note

Do not pull the mounted bus cable to open the contact cover!



Press cable into recess (wrong)



Press cable into recess (correct)

Note

Connection of the bus lines

The bus lines are connected using an insulation displacement system (Fast Connect). The insulation displacement terminals are designed to withstand 10 terminating cycles. If you want to reconnect a line that has already been connected, you must first cut it off.

Note

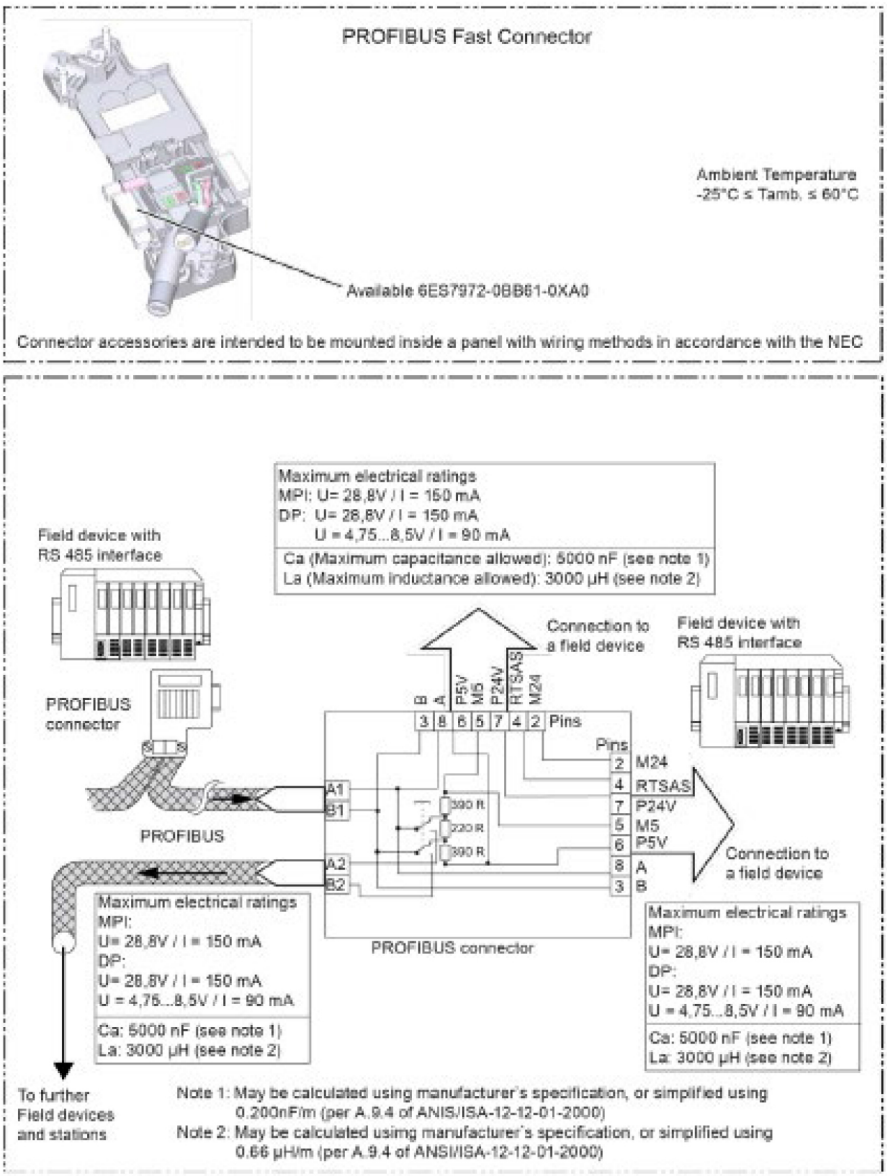
If the switch is set to ON, the PROFIBUS to the other stations is disconnected at this point (e.g. for service purposes).

Bus connection for the first and last station on the PROFIBUS

Cable must always be connected on the left (see marking A1, B1), switch position must be "ON" for the first and last station on the PROFIBUS. (terminating resistor switched on).

Bus connection for all other stations on the PROFIBUS

Cable feed must always be connected on the left (see marking A1, B1). Cable continuation must always be connected on the right (see label A2, B2). Switch position must be "OFF" for all other stations on the PROFIBUS. (terminating resistor switched off).



Approvals

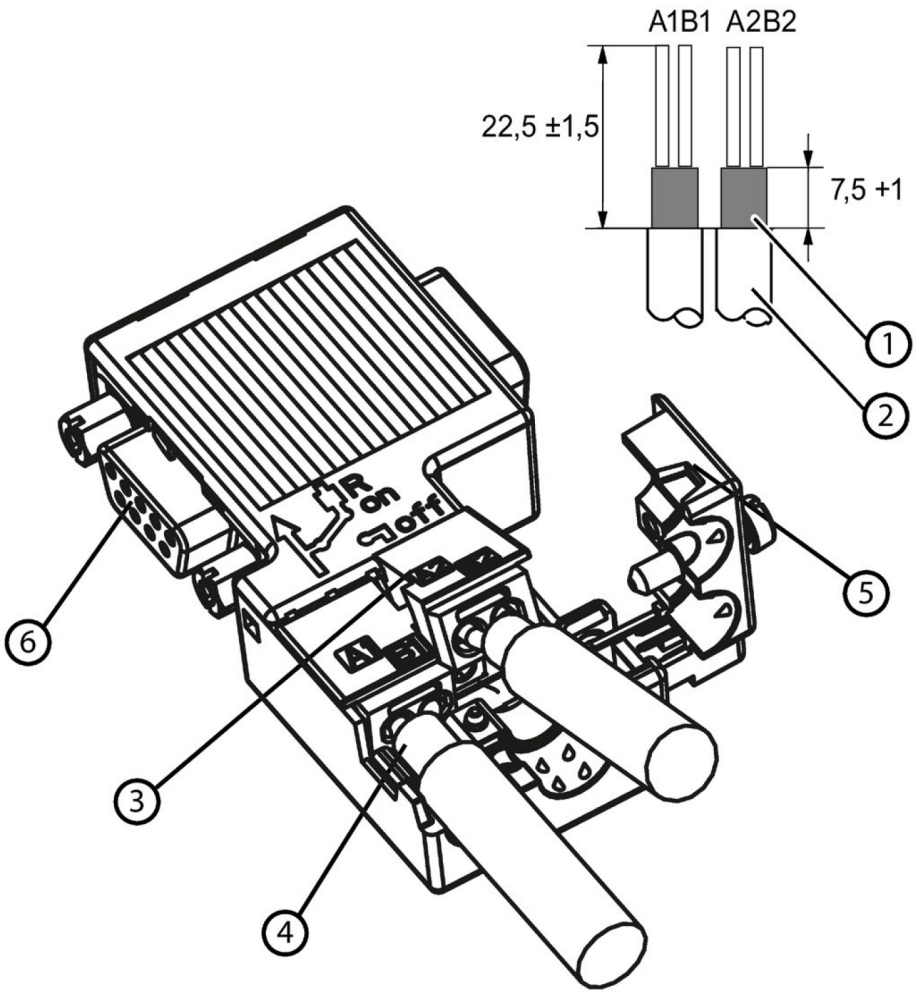
You can find information on the approvals under Standards, approvals and safety notes (Page 29)

Bus cable assembly

Note

Connection of the bus lines

The bus lines are connected using an insulation displacement system (Fast Connect). The insulation displacement terminals are designed to withstand 10 terminating cycles. If you want to reconnect a line that has already been connected, you must first cut it off.



No.	Description
1	Cable shield
2	Bus cable (e.g. 6XV1 830-0EH10) - strip insulation, e.g. with stripping tool 6GK1905-6AA00
3	Contact cover for insulation displacement terminal - Insert the green and red wires into the open contact cover. - Close contact cover (wires are pressed into insulation displacement terminal)
4	Cable shield must be bare on the metal guide
5	Close strain relief and screw down
6	PG socket (only for 6ES7972-0BB70-0XA0)

Note

Do not pull the mounted bus cable to open the contact cover!

Bus connection for the first and last station on the PROFIBUS

Cable must always be connected on the left (see marking A1, B1), switch position must be "ON" for the first and last station on the PROFIBUS. (terminating resistor switched on).

Note

If the switch is set to ON, the PROFIBUS to the other stations is disconnected at this point (e.g. for service purposes).

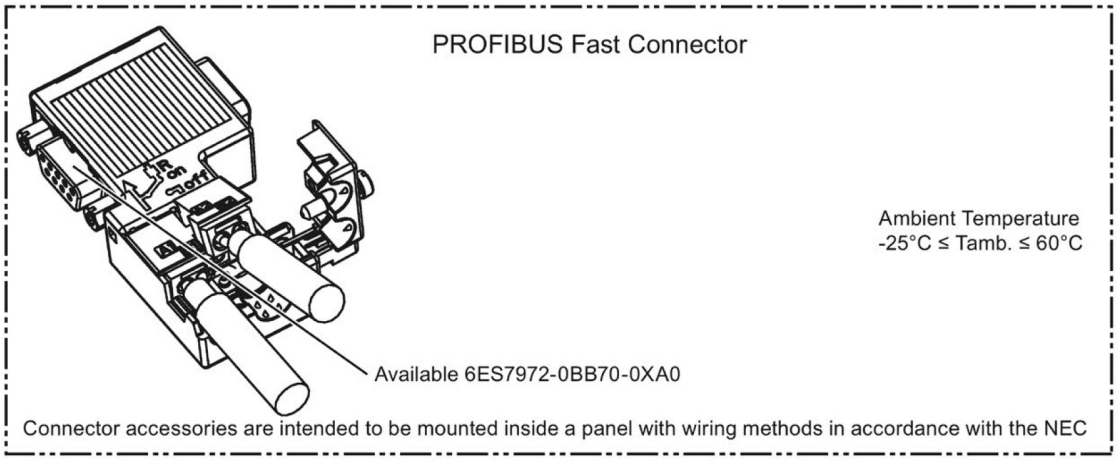
Bus connection for all other stations on the PROFIBUS

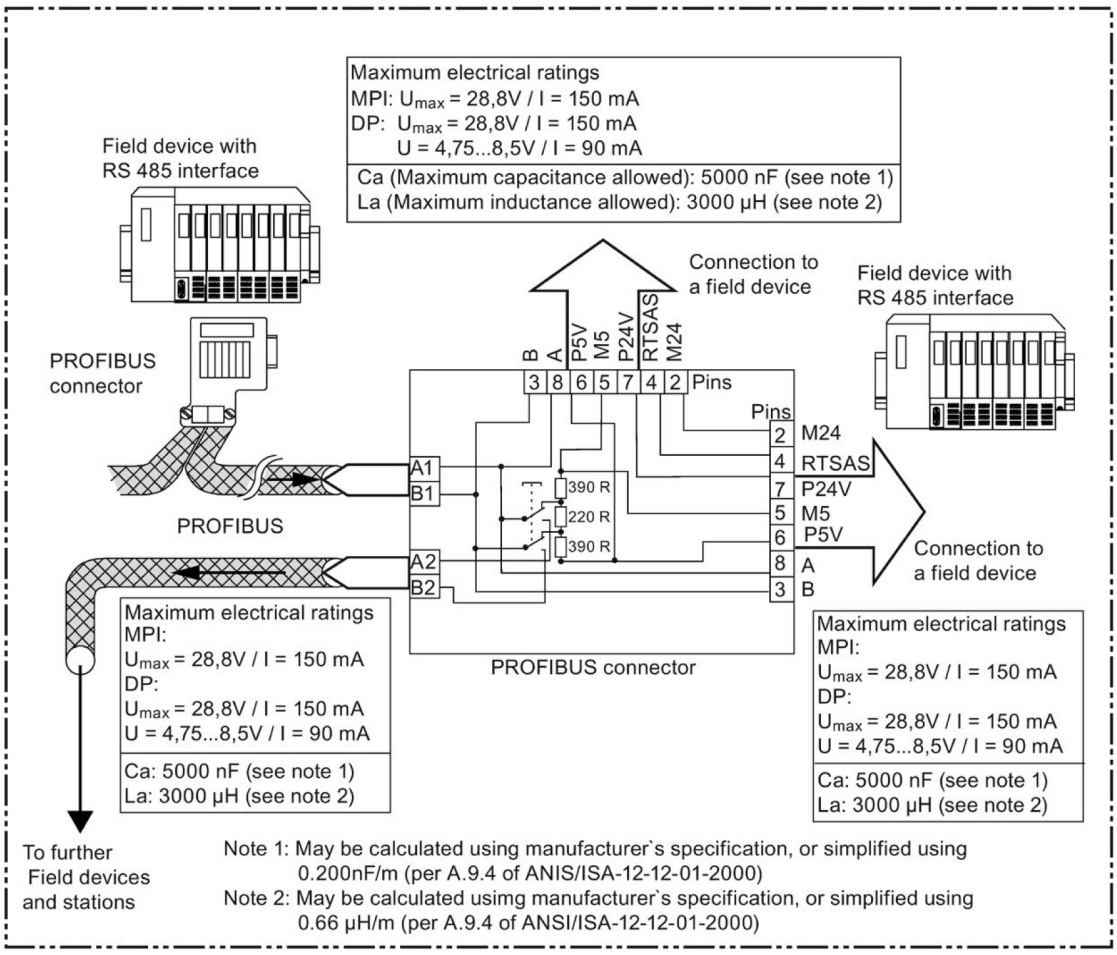
Cable feed must always be connected on the left (see marking A1, B1). Cable continuation must always be connected on the right (see label A2, B2). Switch position must be "OFF" for all other stations on the PROFIBUS. (terminating resistor switched off).

⚠ WARNING

Danger to life from live parts

- Explosion hazard - Do not disconnect circuit while power is present unless area is known to be non-hazardous.
- Explosion hazard - Replacement of components may adversely affect approval for Equipment Group I, Category 2 or Zone 2.
- This device is approved for operation in Equipment Group I, Category 2, Groups A, B, C, D; Equipment Group I, Zone 2; Equipment Group IIC or non-hazardous locations.





Approvals

You can find information on the approvals under Standards, approvals and safety notes (Page 29).

Module-specific data

You can find information under Module-specific data (Page 37).

Safety-related symbols

A

A.1 Safety-related symbols for devices without Ex protection

The following table contains an explanation of the symbols located in your SIMATIC device, its packaging or the accompanying documentation.

Symbol	Meaning
	General warning sign **Caution/Notice** You must read the product documentation. The product documentation contains information about the potential risks and enable you to recognize risks and implement countermeasures.
	Read the information provided by the product documentation. ISO 7010 M002
	Ensure the device is only installed by electrically skilled person. IEC 60417 No. 6182
	Note that connected mains lines must be designed according to the expected minimum and maximum ambient temperature.
	Note that the device must be constructed and connected in accordance with EMC regulations.
	Note that a 230 V device can be exposed to electrical voltages which can be dangerous. ANSI Z535.2
	Note that a device of Protection Class III may only be supplied with a protective low voltage according to the standard SELV/PELV. IEC 60417-1-5180 "Class III equipment"
	Be aware that the device is only approved for the industrial field and only for indoor use.
	Note that an enclosure is required for installing the device. Enclosures are considered: • Standing control cabinet • Serial control cabinet • Terminal boxes • Wall enclosure

A.2 Safety-related symbols for devices with Ex protection

The following table contains an explanation of the symbols located in your SIMATIC device, its packaging or the accompanying documentation.

Symbol	Meaning
	The assigned safety symbols apply to devices **with Ex approval**. You must read the product documentation. The product documentation contains information about the potential risks and enable you to recognize risks and implement countermeasures.
	Read the information provided by the product documentation. ISO 7010 M002
	Ensure the device is only installed by electrically skilled person. IEC 60417 No. 6182
	Observe the mechanical rating of the device.
	Note that connected mains lines must be designed according to the expected minimum and maximum ambient temperature.
	Note that the device must be constructed and connected in accordance with EMC regulations.
	When the device is under voltage, note that it may not be installed or removed, or plugged or pulled.
	Note that a 230 V device can be exposed to electrical voltages which can be dangerous. ANSI Z535.2
	Note that a device of Protection Class III may only be supplied with a protective low voltage according to the standard SELV/PELV. IEC 60417-1-5180 "Class III equipment"
	Be aware that the device is only approved for the industrial field and only for indoor use.

Symbol	Meaning
	For Zone 2 potentially explosive atmospheres, be aware that the device may only be used when it is installed in an enclosure with a degree of protection ≥ IP54.
	For Zone 22 potentially explosive atmospheres, be aware that the device may only be used when it is installed in an enclosure with a degree of protection ≥ IP6x.