

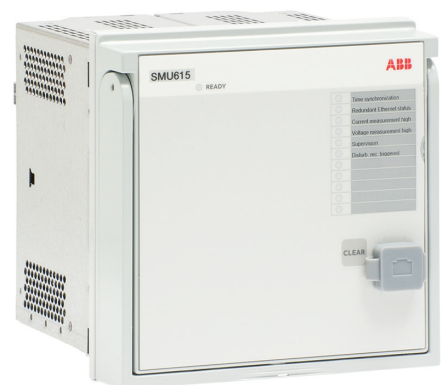
RELION®

# Substation Merging Unit SMU615

## Installation Manual







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## **Conformity**

This product complies with the directive of the Council of the European Communities on the approximation of the laws of the Member States relating to electromagnetic compatibility (EMC Directive 2014/30/EU) and concerning electrical equipment for use within specified voltage limits (Low-voltage directive 2014/35/EU). This conformity is the result of tests conducted by ABB in accordance with the product standard EN 60255-26 for the EMC directive, and with the product standards EN 60255-1 and EN 60255-27 for the low voltage directive. The product is designed in accordance with the international standards of the IEC 60255 series.

## Safety information



Dangerous voltages can occur on the connectors, even though the auxiliary voltage has been disconnected.



Non-observance can result in death, personal injury or substantial property damage.



Only a competent electrician is allowed to carry out the electrical installation.



National and local electrical safety regulations must always be followed.



The frame of the merging unit has to be carefully earthed.



When the plug-in unit has been detached from the case, do not touch the inside of the case. The merging unit case internals may contain high voltage potential and touching these may cause personal injury.



The merging unit contains components which are sensitive to electrostatic discharge. Unnecessary touching of electronic components must therefore be avoided.



Whenever changes are made in the merging unit, measures should be taken to avoid inadvertent tripping.

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# **1 Introduction**

## **1.1 This manual**

The installation manual contains instructions on how to install the merging unit. The manual provides procedures for mechanical and electrical installation. The chapters are organized in the chronological order in which the merging unit should be installed.

## **1.2 Intended audience**

This manual addresses the personnel responsible for installing the product hardware.

The installation personnel must have basic knowledge of handling electronic equipment.

## 1.3 Product documentation

### 1.3.1 Product documentation set

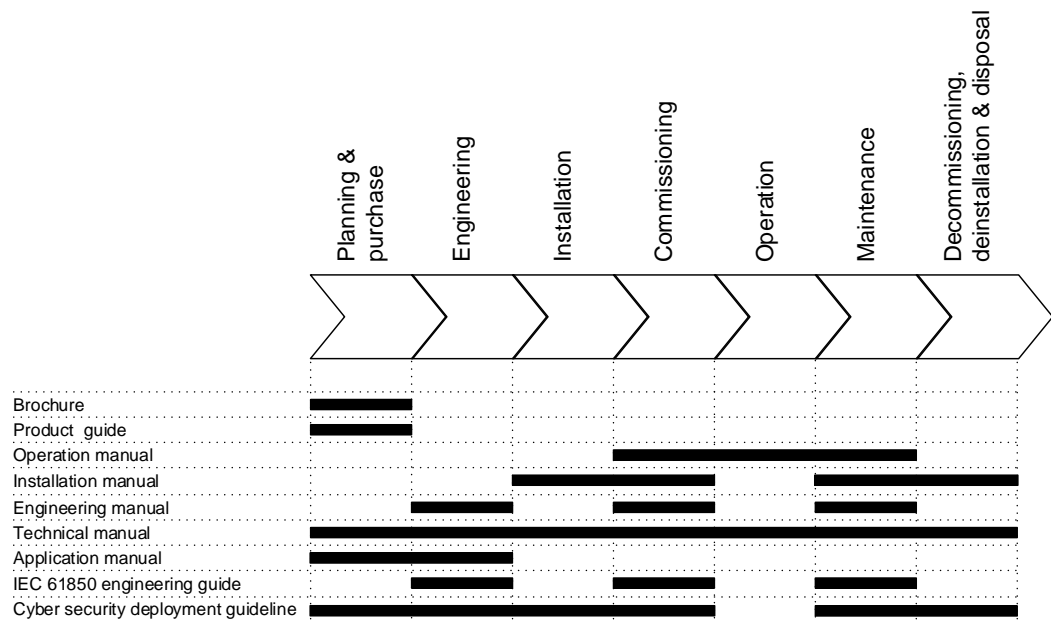


Figure 1: The intended use of documents during the product life cycle

### 1.3.2 Document revision history

Document revision/date	Product version	History
A/2017-09-26	1.0	First release
B/2018-08-31	1.0	Content updated
C/2019-05-17	1.0	Content updated
D/2022-09-30	1.0	Content updated

### 1.3.3 Related documentation



Contact ABB for information on SMU615 related documentation.

## 1.4 Symbols and conventions

### 1.4.1 Symbols



The electrical warning icon indicates the presence of a hazard which could result in electrical shock.



The warning icon indicates the presence of a hazard which could result in personal injury.



The caution icon indicates important information or warning related to the concept discussed in the text. It might indicate the presence of a hazard which could result in corruption of software or damage to equipment or property.



The information icon alerts the reader of important facts and conditions.



The tip icon indicates advice on, for example, how to design your project or how to use a certain function.

Although warning hazards are related to personal injury, it is necessary to understand that under certain operational conditions, operation of damaged equipment may result in degraded process performance leading to personal injury or death. Therefore, comply fully with all warning and caution notices.

### 1.4.2 Document conventions

A particular convention may not be used in this manual.

- Abbreviations and acronyms are spelled out in the glossary. The glossary also contains definitions of important terms.
- Menu paths are presented in bold.

Select **Main menu > Settings**.

- Parameter names are shown in italics.

The function can be enabled and disabled with the *Operation setting*.

- Parameter values are indicated with quotation marks.

The corresponding parameter values are "On" and "Off".

- Input/output messages and monitored data names are shown in Courier font.
- This document assumes that the parameter setting visibility is "Advanced".

## 2 Environmental aspects

### 2.1 Sustainable development

Sustainability has been taken into account from the beginning of the product design including the pro-environmental manufacturing process, long life time, operation reliability and disposing of the merging unit.

The choice of materials and the suppliers have been made according to the EU RoHS directive (2002/95/EC). This directive limits the use of hazardous substances which are the following:

**Table 1: Maximum concentration values by weight per homogeneous material**

Substance	Proposed maximum concentration
Lead - Pb	0.1%
Mercury - Hg	0.1%
Cadmium - Cd	0.01%
Hexavalent Chromium Cr (VI)	0.1%
Polybrominated biphenyls - PBB	0.1%
Polybrominated diphenyl ethers - PBDE	0.1%

Operational reliability and long life time have been assured with extensive testing during the design and manufacturing processes. Moreover, long life time is supported by maintenance and repair services as well as by the availability of spare parts.

Design and manufacturing have been done under a certified environmental system. The effectiveness of the environmental system is constantly evaluated by an external auditing body. We follow environmental rules and regulations systematically to evaluate their effect on our products and processes.

### 2.2 Disposal of a merging unit

Definitions and regulations of hazardous materials are country-specific and change when the knowledge of materials increases. The materials used in this product are typical for electric and electronic devices.

All parts used in this product are recyclable. When disposing of a merging unit or its parts, contact a local waste handler who is authorized and specialized in disposing of electronic waste. These handlers can sort the material by using dedicated sorting processes and dispose of the product according to the local requirements.

**Table 2: Materials of the merging unit parts**

Merging unit	Parts	Material
Case	Metallic plates, parts and screws	Steel
	Plastic parts	PC <sup>1</sup> , LCP <sup>2</sup>
	Electronics plug in module	Various
Plug-in unit	Electronics plug in modules	Various
	Electronics LHMI module	Various
	Plastic parts	PC, PBT <sup>3</sup> , LCP, PA <sup>4</sup>
	Metallic parts	Aluminium
Package	Box	Cardboard
Attached material	Manuals	Paper

---

<sup>1</sup> Polycarbonate

<sup>2</sup> Liquid crystal polymer

<sup>3</sup> Polybutylene terephthalate

<sup>4</sup> Polyamide

## 3 Unpacking, inspecting and storing

### 3.1 Removing transport packaging

Merging units require careful handling.

1. Examine the delivered products to ensure that they have not been damaged during the transport.
2. Remove the transport packaging carefully without force.
3. Attach the protective film (supplied with the merging unit) on the top side of the unit for the installation phase.



Before connecting the auxiliary power, remove the protective film from top of the merging unit.



The cardboard packaging material is 100% recyclable.

### 3.2 Inspecting product and delivery items

#### 3.2.1 Identifying product

1. Locate the merging unit's order number from the label on top of the plug-in unit.
2. Compare the merging unit's order number with the ordering information to verify that the received product is correct.

#### 3.2.2 Checking delivery items

- Check that all items are included in the delivery in accordance with the delivery documents.

#### 3.2.3 Inspecting product

Merging units require careful handling before installation on site.

- Check the merging unit to see if any damage occurred during transportation.

If the merging unit has been damaged during transportation, make a claim against the transport contractor, and notify the local ABB representative.

### **3.2.4 Returning a product damaged in transit**

- If damage has occurred during transport, appropriate actions must be taken against the latest carrier. Please inform the nearest ABB office or representative.
- Notify ABB immediately if there are any discrepancies in relation to the delivery documents.

## **3.3 Storing**

If the merging unit is stored before installation, it must be done in the original transport packaging in a dry and dust free place.

Observe the environmental requirements stated in the technical manual.



## 4 Mounting

### 4.1 Checking environmental conditions and mounting space

The mechanical and electrical environmental conditions at the installation site must be within the limits described in the technical manual.

- Avoid installation in dusty, damp places.  
Avoid places susceptible to rapid temperature variations, powerful vibrations and shocks, surge voltages of high amplitude and fast rise time, strong induced magnetic fields or similar extreme conditions.
- Check that sufficient space is available.  
Sufficient space is needed at the front and rear of the merging unit to allow access to wires and optical fibers to provide sufficient ventilation to the merging unit and to enable maintenance and future modifications.
- Ensure that flush-mounted merging units can be added and replaced without excessive dismantling.

### 4.2 Detaching and installing plug-in unit

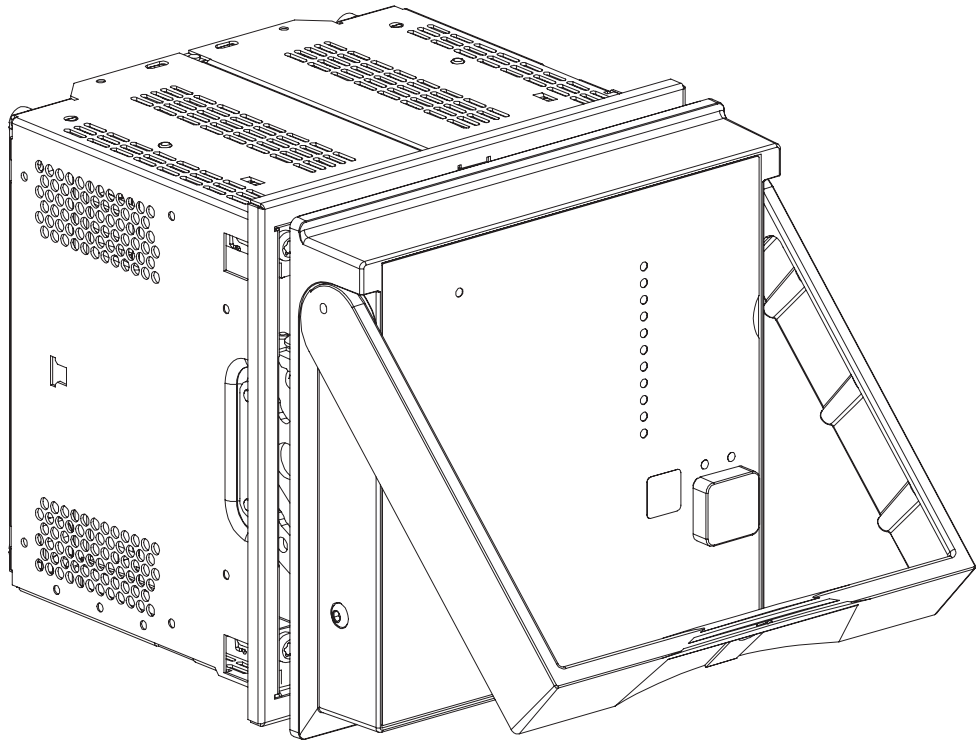
#### 4.2.1 Detaching plug-in unit



Before detaching the plug-in unit from the case, the auxiliary voltage must be disconnected.

1. Turn off the power.
2. Open the seal on the front panel by removing the sealing wire and screw the sealing screw all the way in.

3. Lift the handle to 90 degrees to release the latching mechanism.  
The plug-in unit is pushed about 7 mm out of the case and the connectors are separated.
4. Pull the unit out of the case.



*Figure 2: Detaching a plug-in unit from the case*



The merging unit features an automatic short-circuit mechanism in the CT connector. Therefore, detaching the plug-in unit will not open the secondary circuit of the CT which could cause dangerously high voltages.



Do not touch terminals inside the case after removing the plug-in unit. Live terminals can be inside the case.



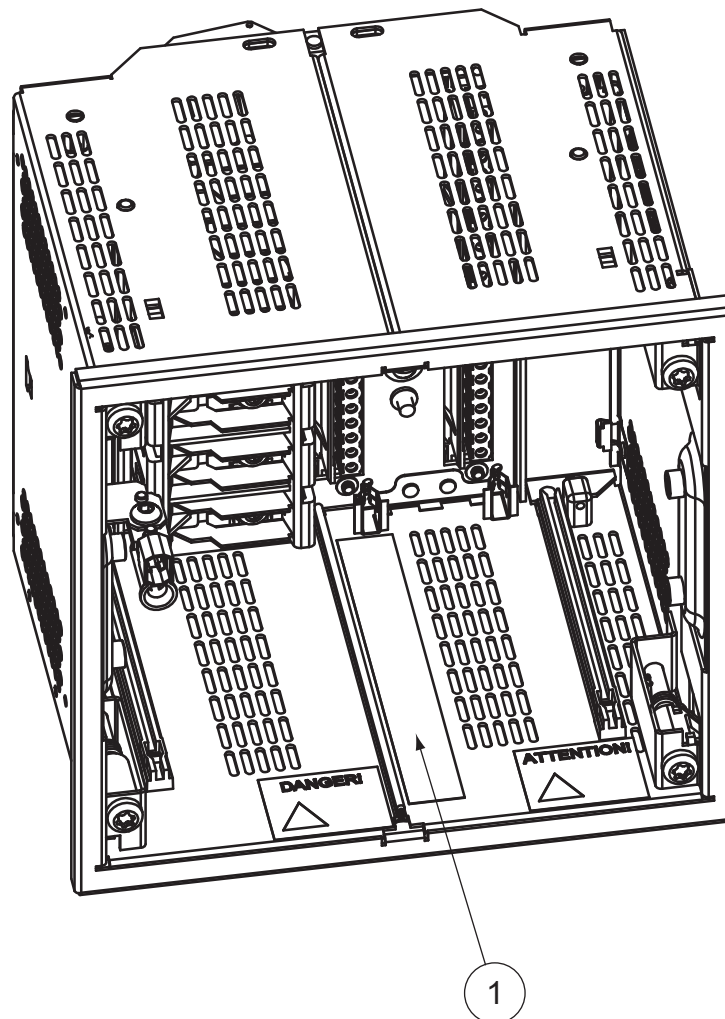
The signal connectors are left open when the plug-in unit is detached.

### 4.2.2 Installing plug-in unit

The merging unit is constructed in a way that a plug-in unit with voltage- or current-measuring inputs can only be plugged into a corresponding case. This prevents fitting an unsuitable plug-in unit into a wrong case.



Before fitting the plug-in unit into the case, check that the unit and the case have the same serial number.



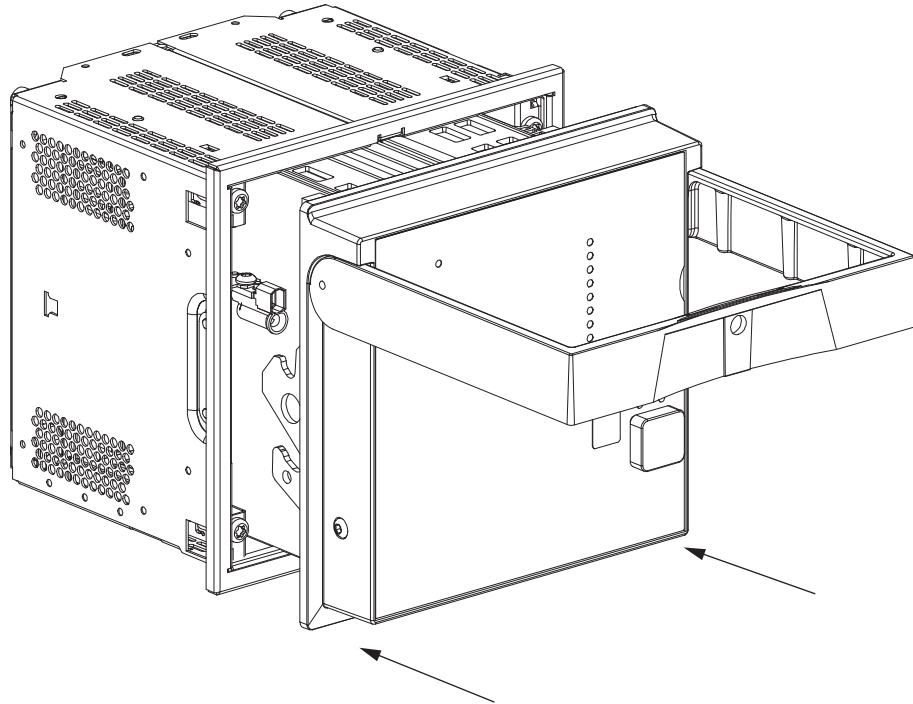
1 Rating label with serial number

*Figure 3: Serial number in the case*



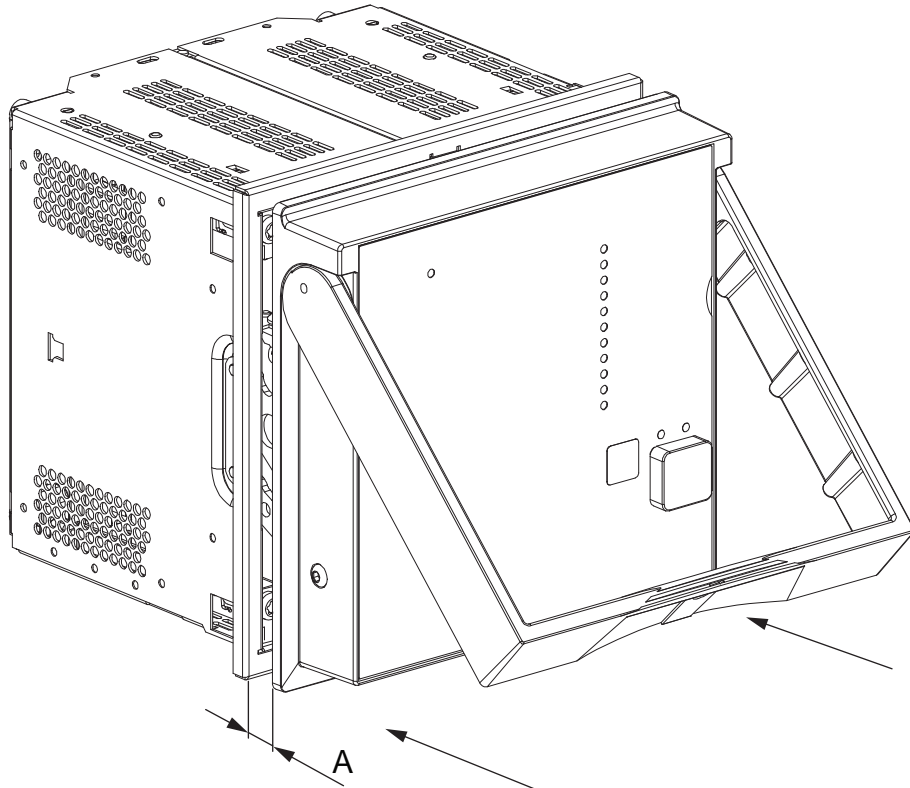
Forcing an unsuitable plug-in unit into the case can break both the plug-in unit and the case and may cause danger.

1. Lift the handle 90 degrees and push the plug-in unit into the case.



*Figure 4: Installing a plug-in unit into the case*

2. Let the handle swing down about 45 degrees. At the same time, push the plug-in unit into the case as far as it goes.  
Plug-in unit stops at about 7 mm distance from the case.



A 7 mm

*Figure 5: Pushing the plug-in unit into the case*

3. Turn down the handle to push the plug-in unit into its final position in the case.

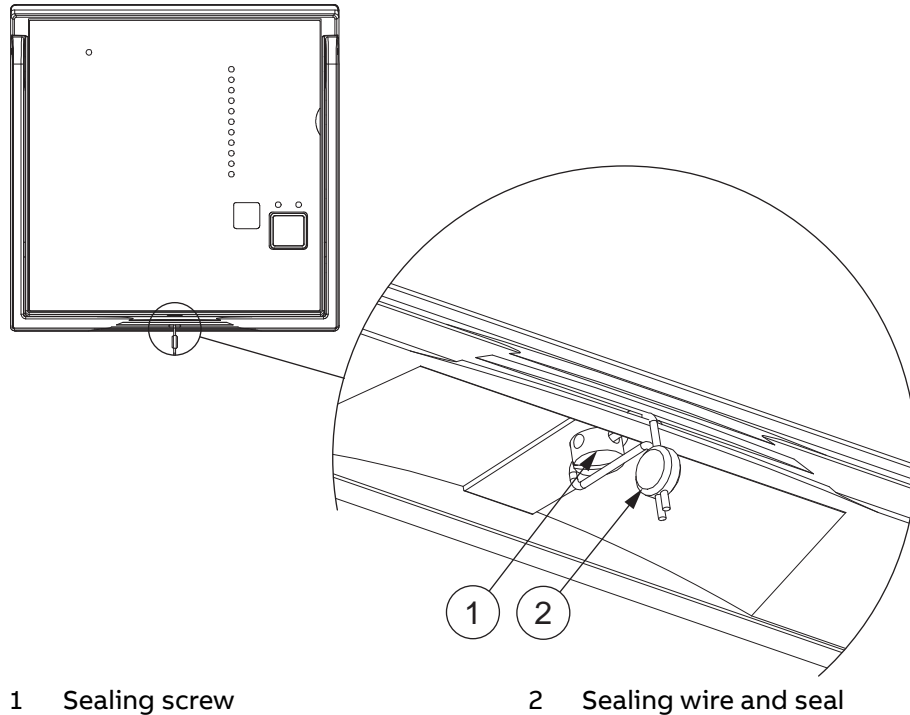


The handle must be locked or sealed to secure the mechanical performance under any conditions caused by vibration, pressure, shock or bump, seismic activity or other equivalent circumstances.

### 4.2.3 Sealing plug-in unit

The front panel of the merging unit has an integrated sealing screw. By default the screw is screwed all the way in and is not used when installing or detaching the plug-in unit.

1. Open the sealing screw about nine turns.
2. Thread a sealing wire through the holes in the sealing screw and the handle.



1 Sealing screw

2 Sealing wire and seal

*Figure 6: Sealing screw*

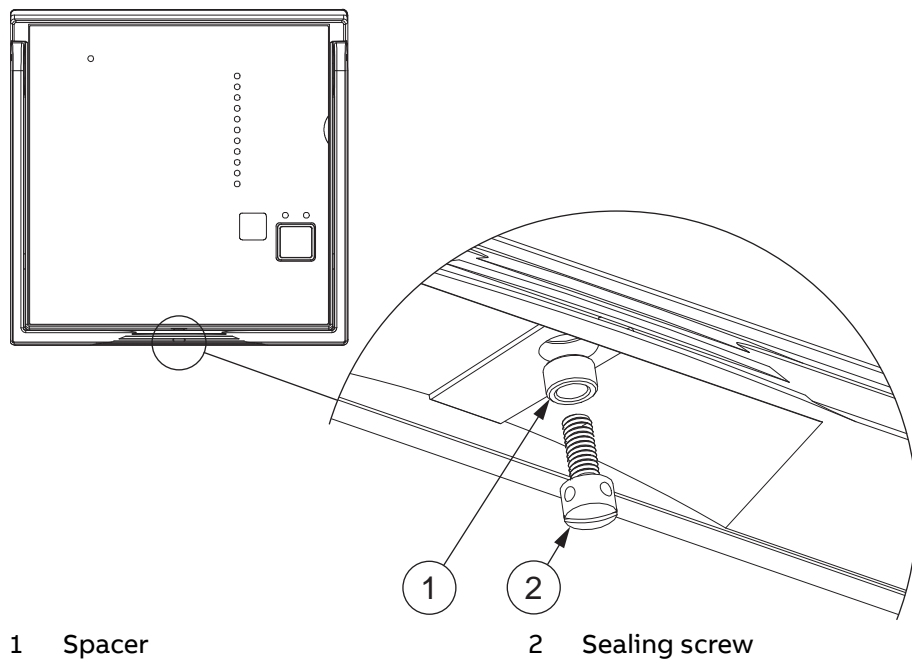
#### 4.2.4 Securing handle

The front panel of the merging unit has an integrated sealing screw. By default, the screw is screwed all the way in and not used when installing or detaching the plug-in unit. Instead of sealing the plug-in unit, the sealing screw and the spacer supplied with the merging unit can be used for securing the handle in place.

1. Fully open the sealing screw and remove it.
2. Re-insert the sealing screw with the spacer.



The merging unit packaging includes a plastic bag containing loose parts such as the spacer.



1 Spacer

2 Sealing screw

*Figure 7: Sealing screw with spacer*

## 4.3 Mounting merging unit

### 4.3.1 Required tools

- T25 Torx screwdriver for mounting the case
- T20 Torx screwdriver for connecting the protective earthing



Only use adjustable torque screwdrivers.

### 4.3.2 Flush mounting merging unit

All the mounting elements are integrated in the merging unit.

Requirements for installation:

- Panel cut-out of 165.5 × 161.5 mm
- Depth behind the panel 153 mm

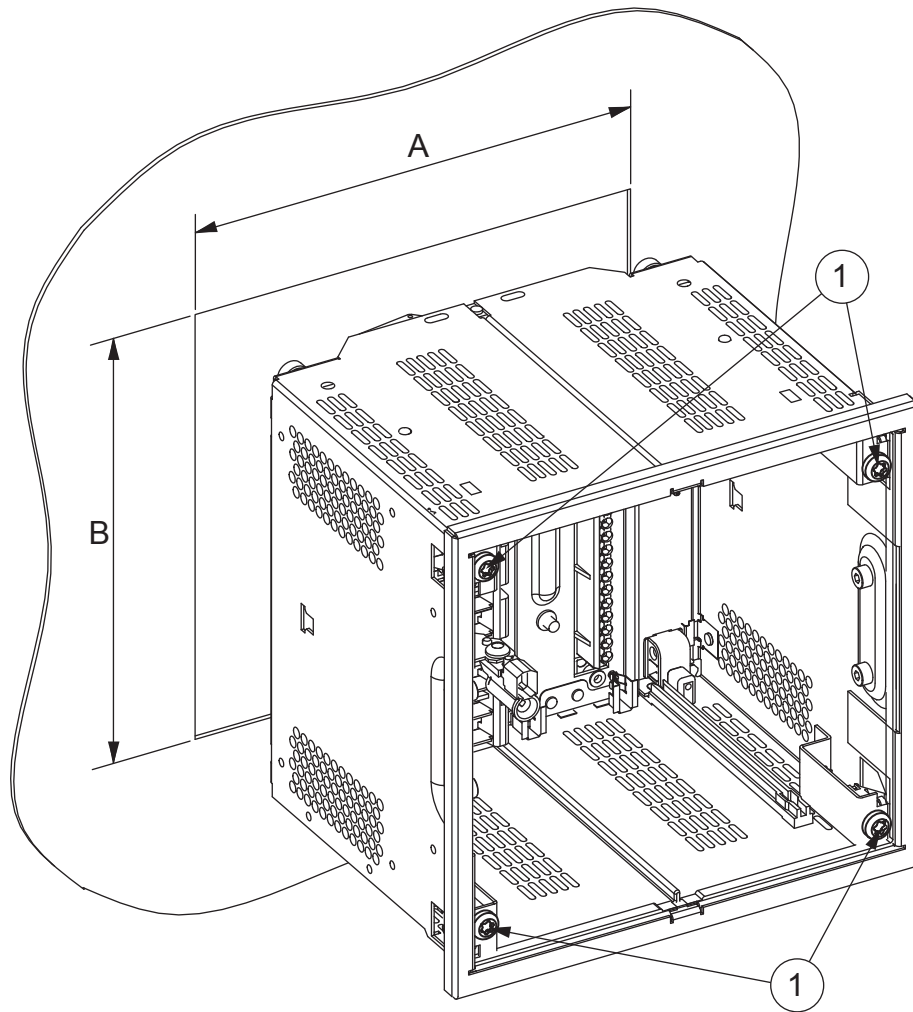


A merging unit equipped with optical connections requires a minimum depth of 180 mm. The allowed minimum bending radius has to be checked from the optical cable manufacturer.

1. Loosen the four M5 fixing screws in the case to fit the case into the panel cut-out.



2. Mount the case to the panel cut-out.



A 165.5 ±1 mm  
B 161.5 ±1 mm

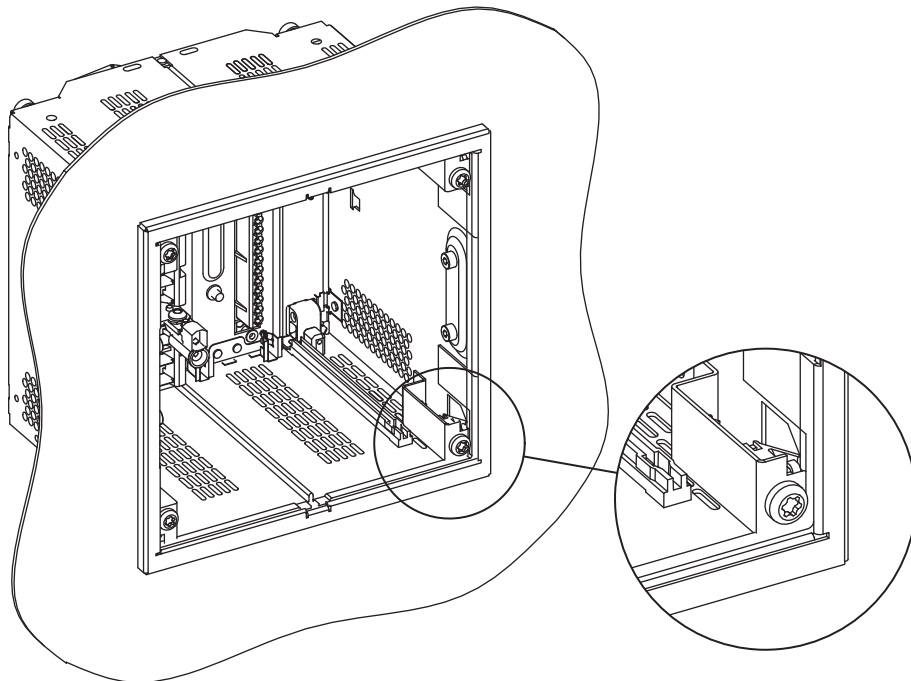
1 M5 fixing screws

*Figure 8: Flush mounting a case into a panel cut-out*

3. Tighten the M5 (T25) screws.



The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.



*Figure 9: Flush mounted case, tightening the M5 fixing screws*

4. Install the plug-in unit into the case.

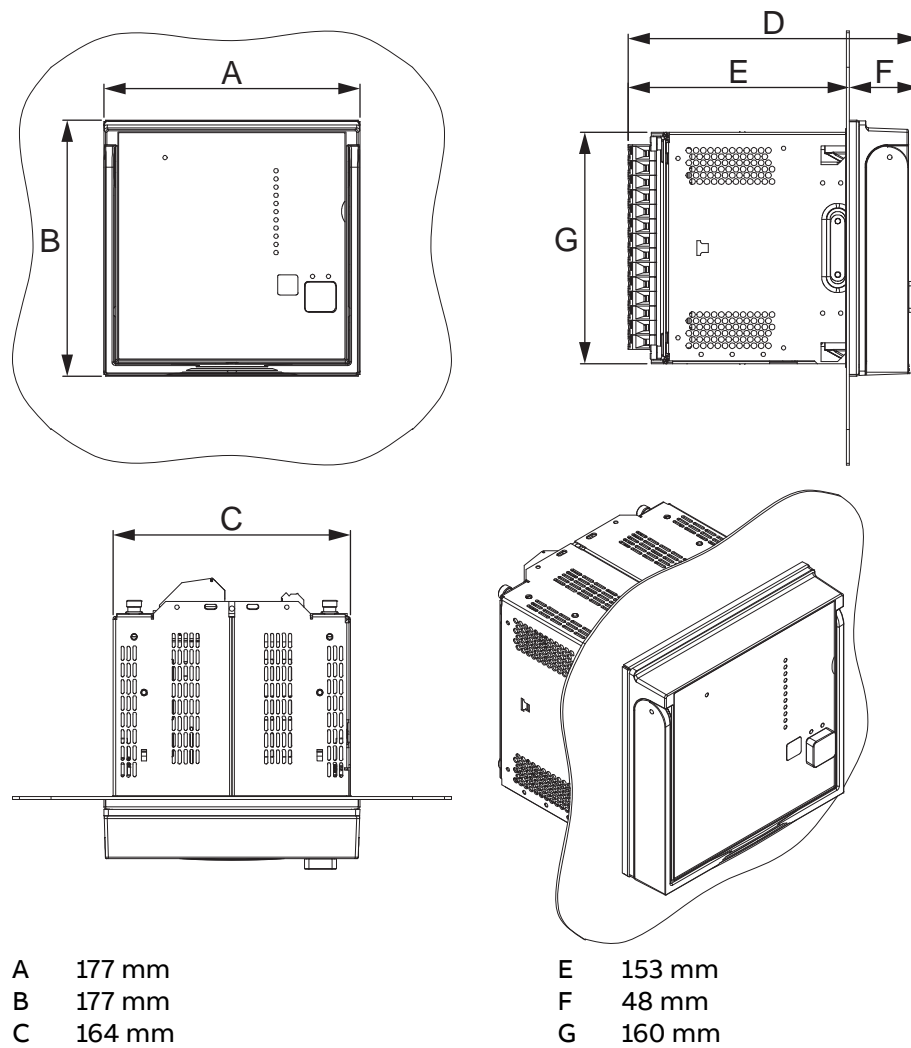


Figure 10: Flush mounted case and plug-in unit

### 4.3.3 Semi-flush mounting merging unit

A mounting kit is needed for semi-flush mounting the merging unit. In addition to the detailed mounting instructions, the mounting kit includes:

- Raising frame
- Gasket
- Screws

Requirements for installation:

- Panel cut-out of 165.5 × 161.5 mm with mounting holes
- Depth behind the panel 103 mm
- When IP 54 degree of protection (according to IEC 60529) is required for the front side, a gasket has to be used in the installation.

1. Mount the raising frame into the panel cut-out with four M4 screws.

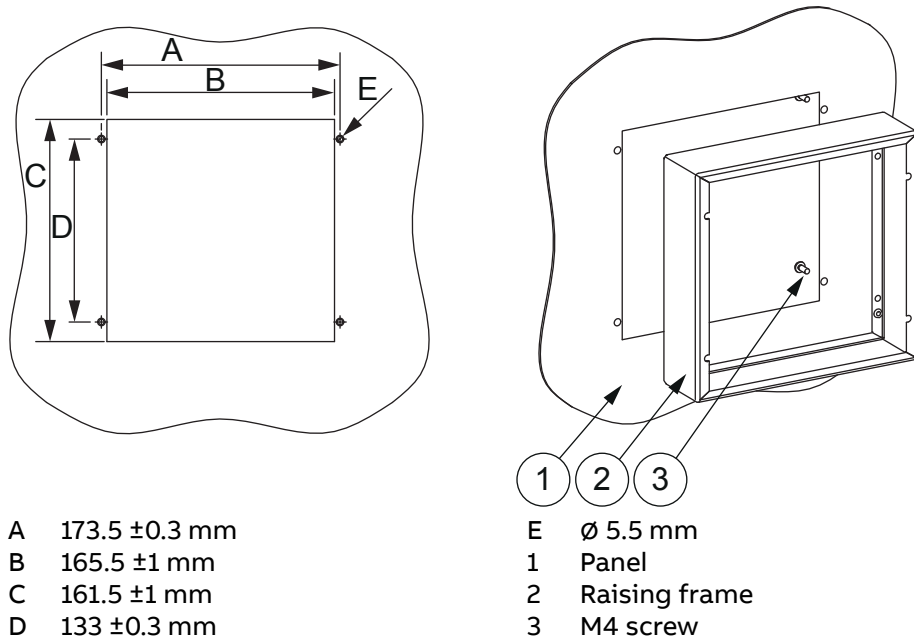


Figure 11: Mounting the raising frame

2. Loosen the four M5 fixing screws in the case to fit the case to the raising frame.
3. Remove the protective film temporarily from the top side of the case.
4. Mount the case to the raising frame.

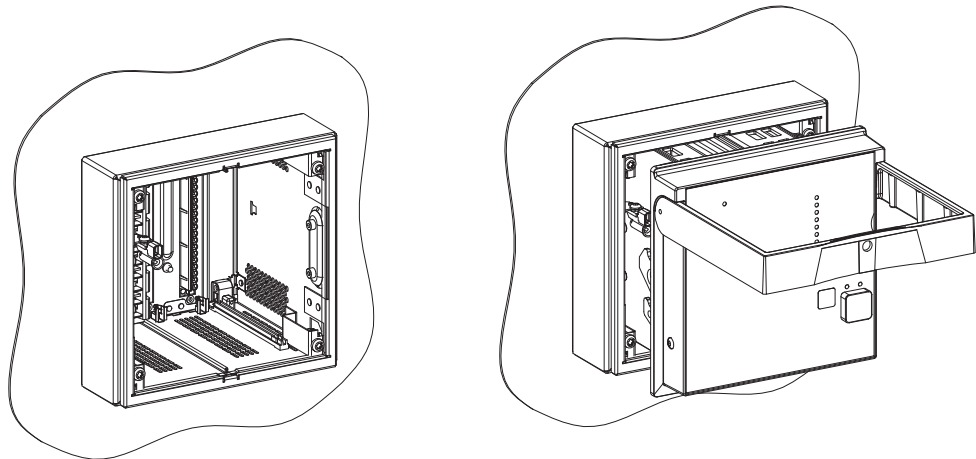


Figure 12: Mounting the case

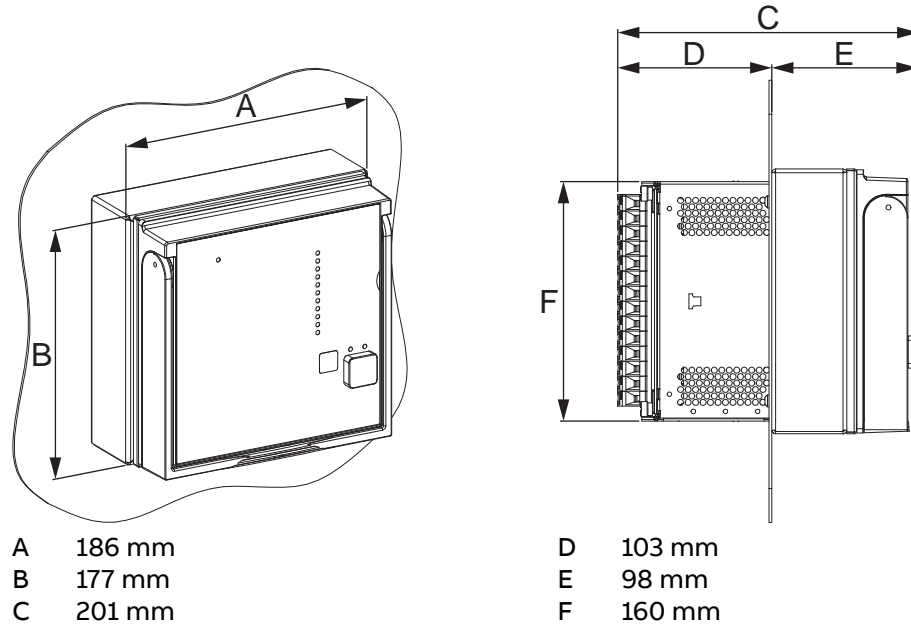
5. Tighten the M5 screws.



The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.

6. Attach the protective film back on the top side of the case.
7. Install the plug-in unit into the case.

The purpose of the protective film is to prevent debris falling inside the unit while installing electrical wiring. Remove the protective film before energizing the merging unit.



*Figure 13: Semi-flush mounted merging unit*



Check the allowed minimum bending radius from the optical cable manufacturer.

#### 4.3.4 Semi-flush mounting merging unit inclined

A mounting kit is needed for semi-flush mounting the merging unit inclined. In addition to the detailed mounting instructions, the mounting kit includes:

- Angle frame
- Gasket
- Screws

Requirements for installation

- Panel cut-out of 167 × 203 mm with mounting holes
- Depth behind the panel 107 mm
- When IP 54 degree of protection (according to IEC 60529) is required for the front side, a gasket has to be used in the installation.

1. Mount the angle frame into the panel cut-out with four M4 screws.

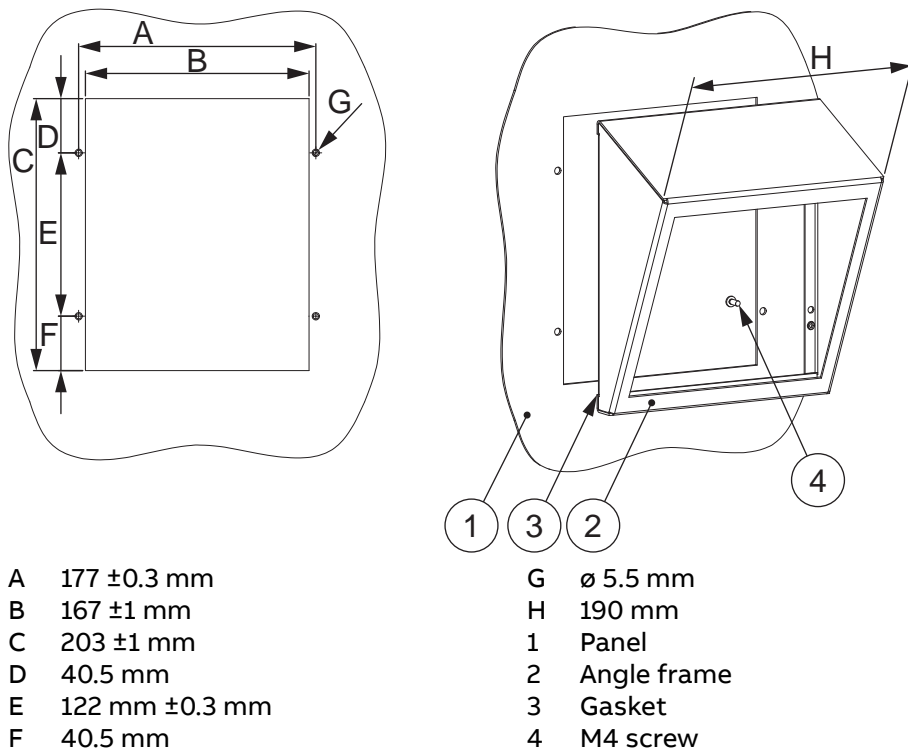


Figure 14: Mounting the angled frame

2. Loosen the four M5 fixing screws in the case to fit the case into the angle frame.
3. Mount the case to the angle frame.  
With the angled frame, the merging unit can be mounted inclined downward to a 25° angle.
4. Tighten the screws.



The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.

5. Install the plug-in unit into the case.

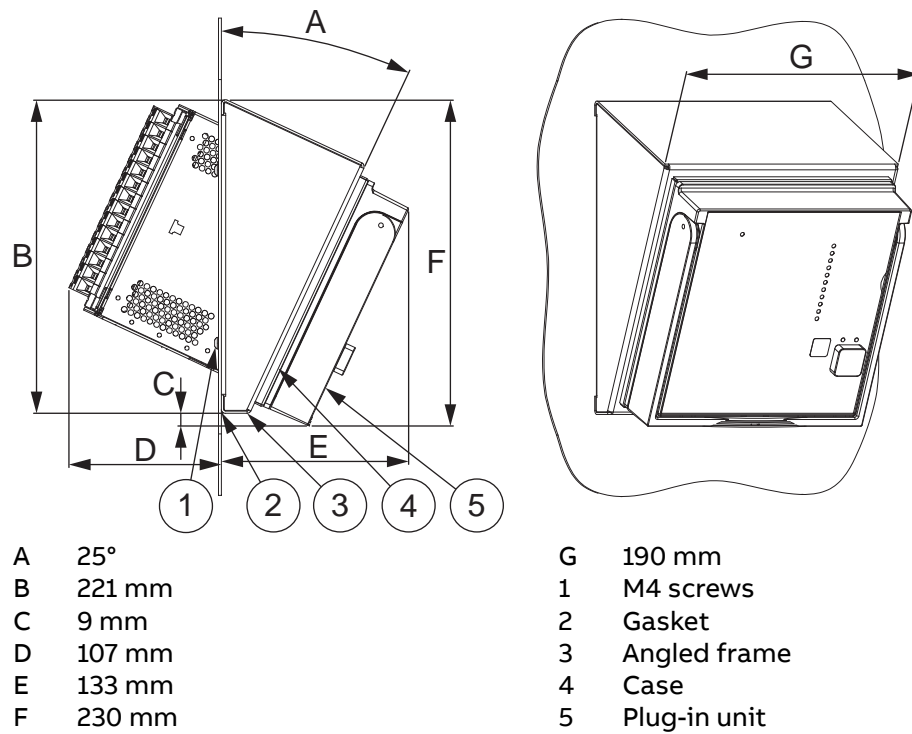


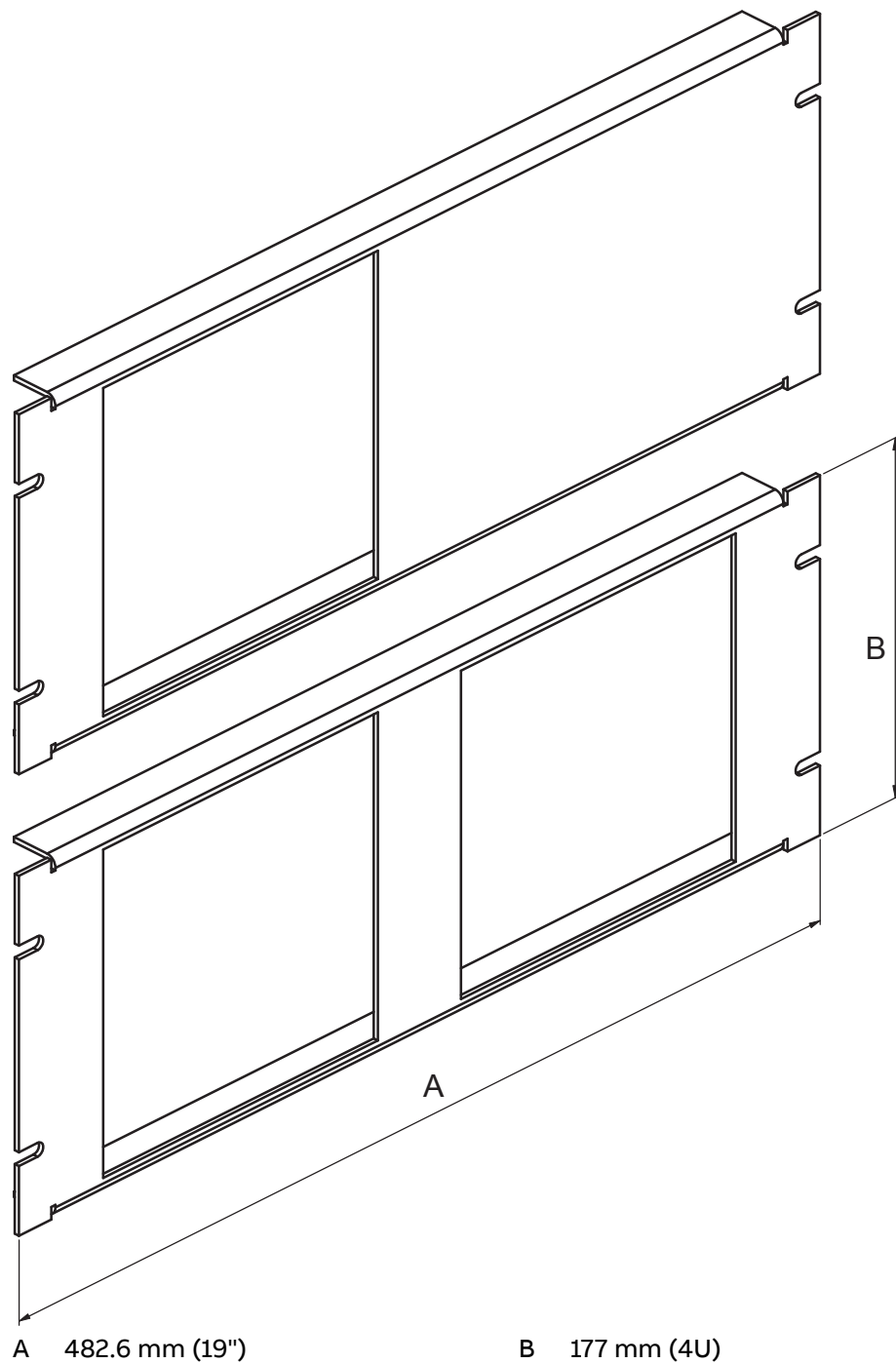
Figure 15: Merging unit semi-flush mounted inclined

### 4.3.5 Rack mounting merging unit

A mounting kit is needed for rack mounting the merging unit. In addition to the detailed mounting instructions, the 19" rack mounting kit includes:

- Mounting panel; the type of the mounting panel depends on the number of mounted devices
  - Screws
1. Mount the mounting panel to a 19" rack.
  2. Loosen the four M5 fixing screws in the case to fit the case into the panel cut-out.

3. Mount the case to the panel cut-out.



*Figure 16: 19" rack mounting panels*

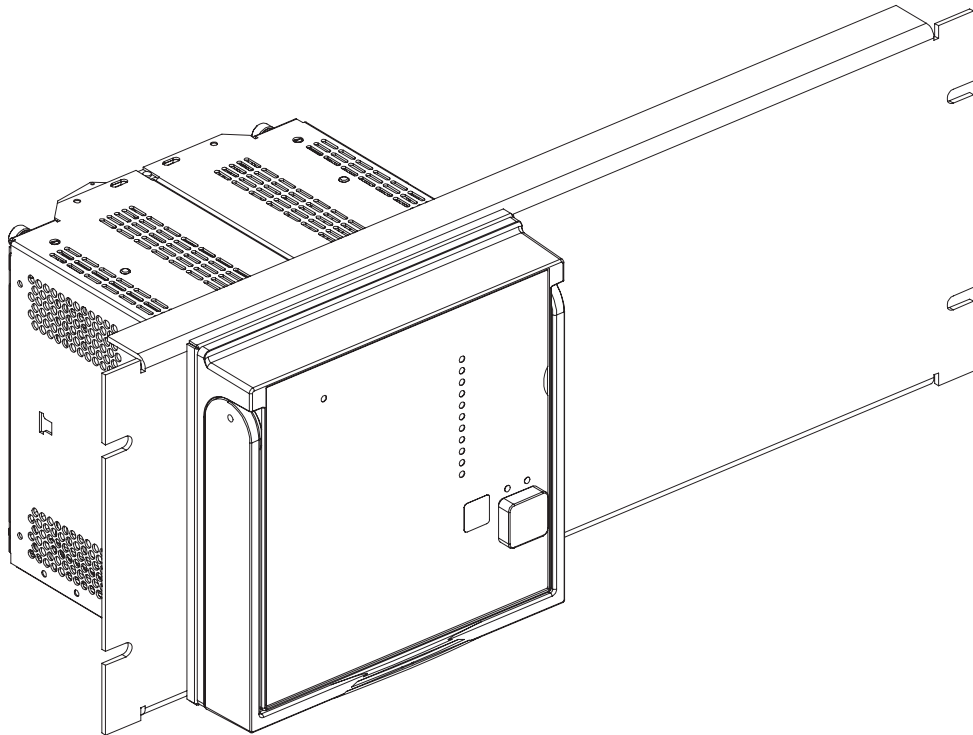
4. Tighten the screws.



The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.

5. Install the plug-in unit into the case.





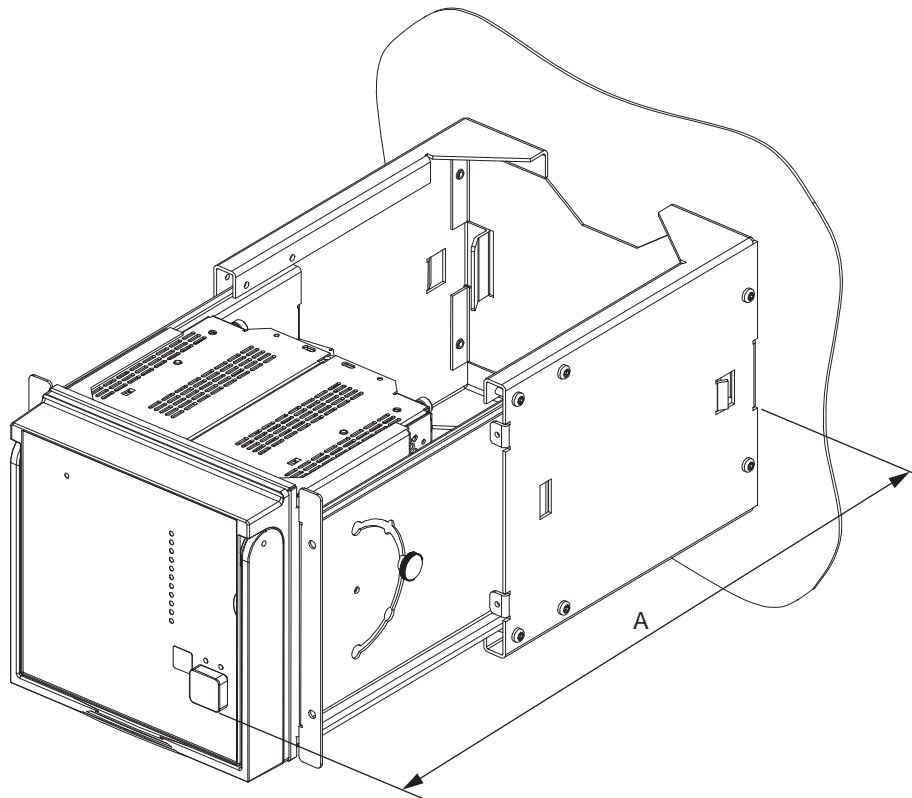
*Figure 17: Rack mounted merging unit*

### 4.3.6 Wall mounting merging unit

A mounting kit is needed for wall mounting the merging unit. In addition to the detailed mounting instructions, the wall mounting kit includes:

- Wall mounting frame and rail parts
  - Back plate
  - Screws
  - Dimensions for screw holes
1. Drill screw holes according to the dimensional drawing.
  2. Mount the wall mounting frame and the rails.
  3. Install the back plate.
  4. Loosen the four M5 fixing screws in the case to fit the case into the mounting frame.

5. Mount the case between the rails.



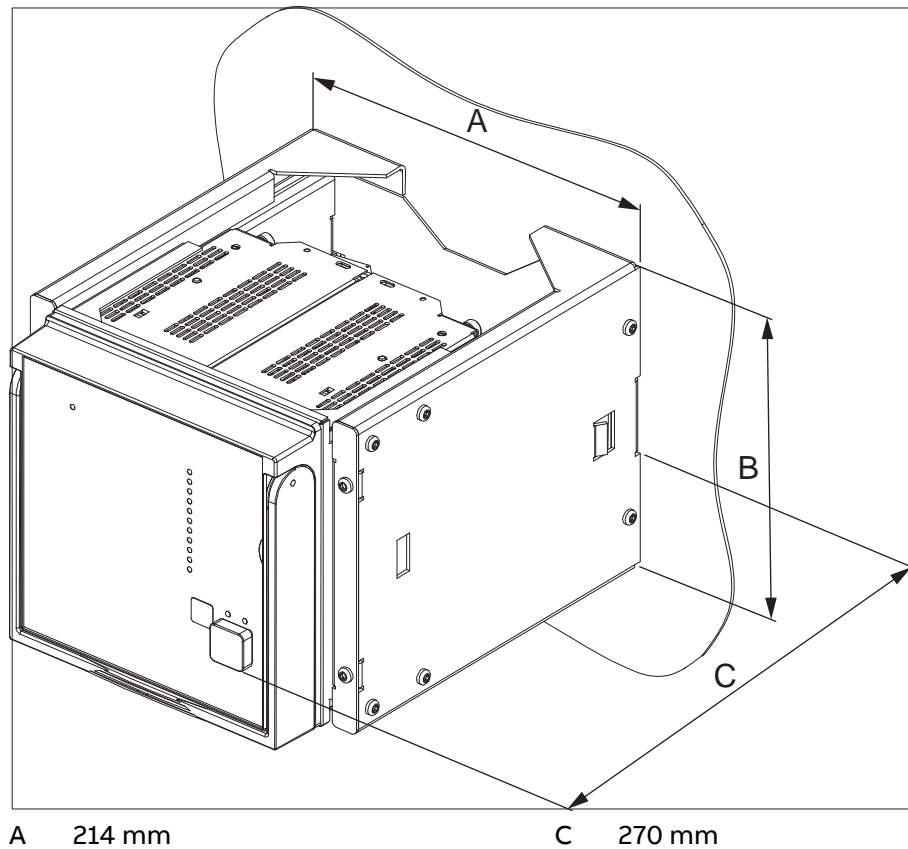
A 430 mm

*Figure 18: Wall mounting the merging unit*

6. Tighten the screws.



The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.



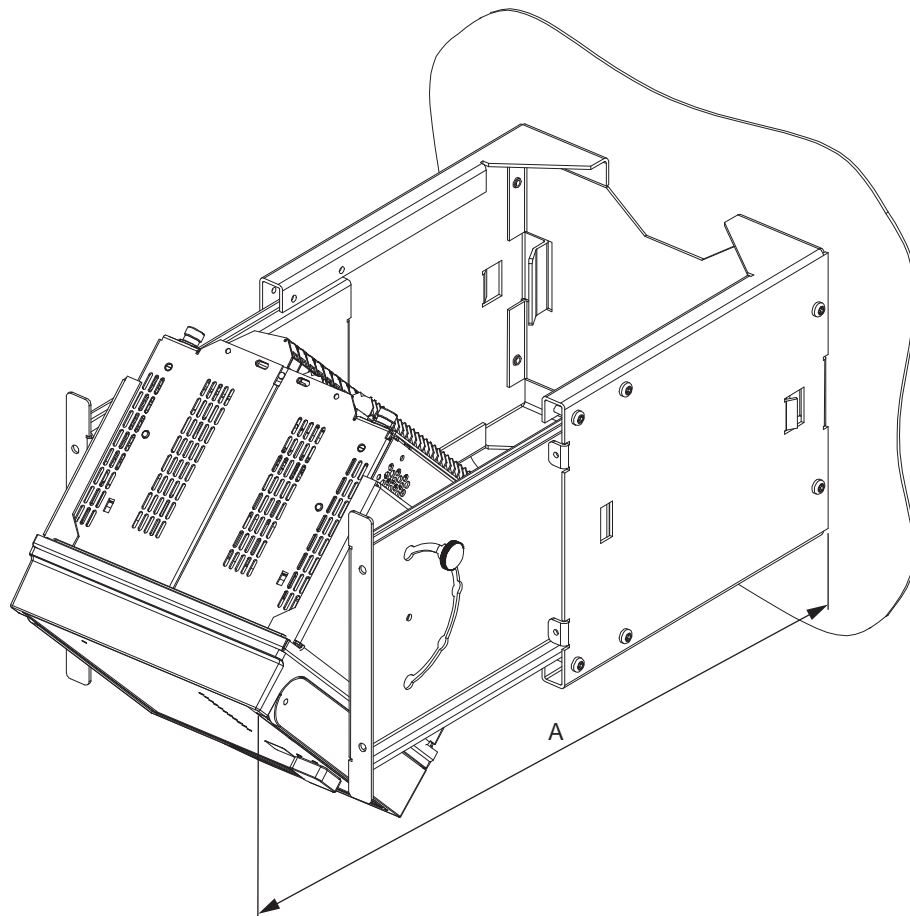
*Figure 19: Wall mounted merging unit*



Minimum of 50 mm space is needed between two kits.

When connecting the wires, a wall-mounted merging unit can be pulled out and turned 45° (or 90°) degrees downwards or upwards.

- To release the merging unit for pulling it out, push the locks beside the mounting frame.
- To rotate the merging unit, loosen the knurled-head screws in the rails.



A 455 mm

Figure 20: Wall mounted merging unit in rotated position



Minimum of 50 mm space is needed above and below the frame for rotating.

#### 4.3.7

### Rack mounting merging unit and test switch RTXP into 19" equipment frame

A mounting kit is needed for rack mounting the merging unit into a 19" equipment frame. In addition to the detailed mounting instructions, the mounting kit includes:

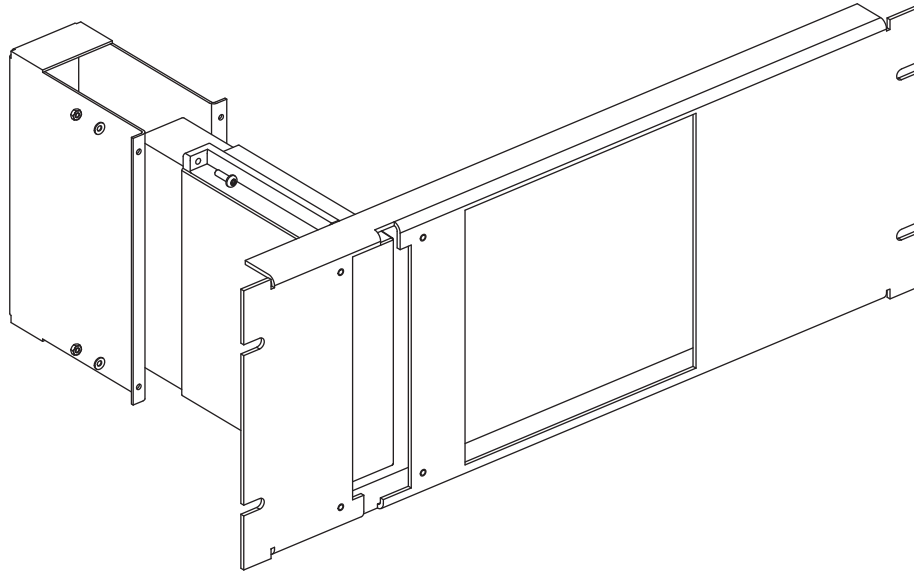
- Mounting panel
- Metallic frame for mounting the RTXP 18 or 24 test switch to the panel



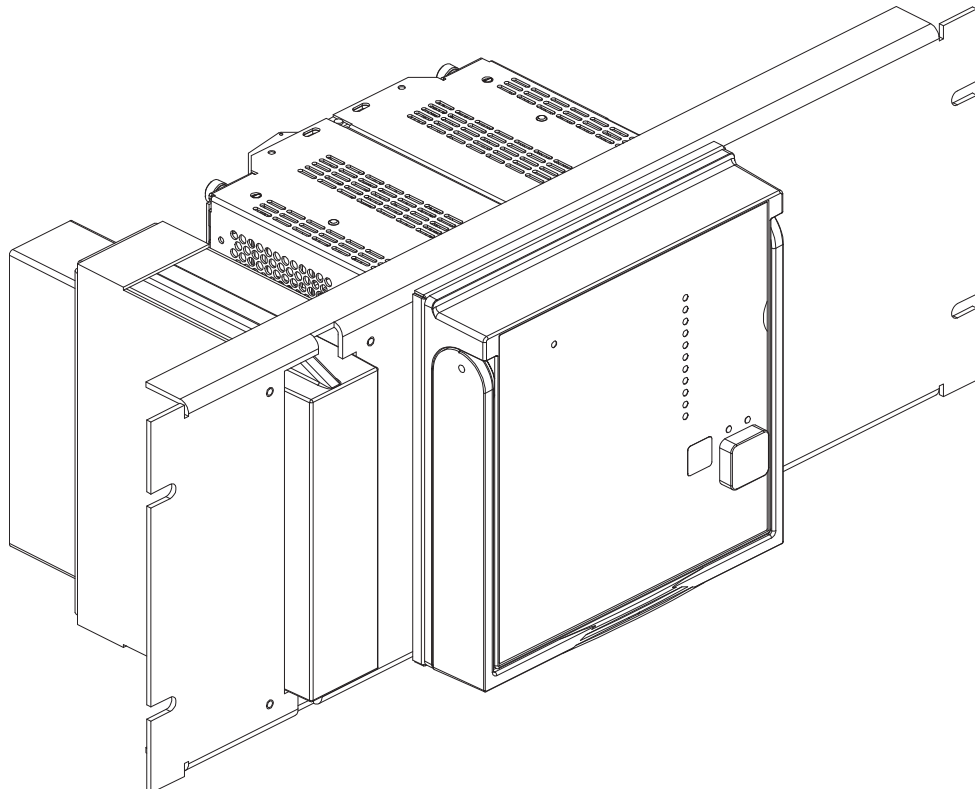
A merging unit equipped with optical connections requires a minimum depth of 180 mm. The allowed minimum bending radius has to be checked from the optical cable manufacturer.

1. Mount the mounting panel into the 19" rack.
2. Loosen the four M5 fixing screws in the case to fit the case into the panel cut-out.

3. Mount the case to the panel cut-out.
4. Install the optional metallic frame to mount the RTXP 18 or 24 test switch to the panel.



*Figure 21: Mounting of the metallic frame for an RTXP 18 test switch*



*Figure 22: Merging unit and the test switch RTXP 18 mounted into a 19" equipment panel*

### 4.3.8 Rack mounting merging unit into combiflex 19" equipment frame (Type RHGT 19" 4U variant C)

A mounting bracket is needed for rack mounting the merging unit into a combiflex 19" equipment frame, a different bracket is in installation with test switch. In addition to the detailed mounting instructions, the mounting kit includes:

- Mounting bracket for the case and optionally with RTXP test switch
1. Install the mounting bracket into the combiflex equipment frame by using tapping screws ST3.5x13 from rear side.

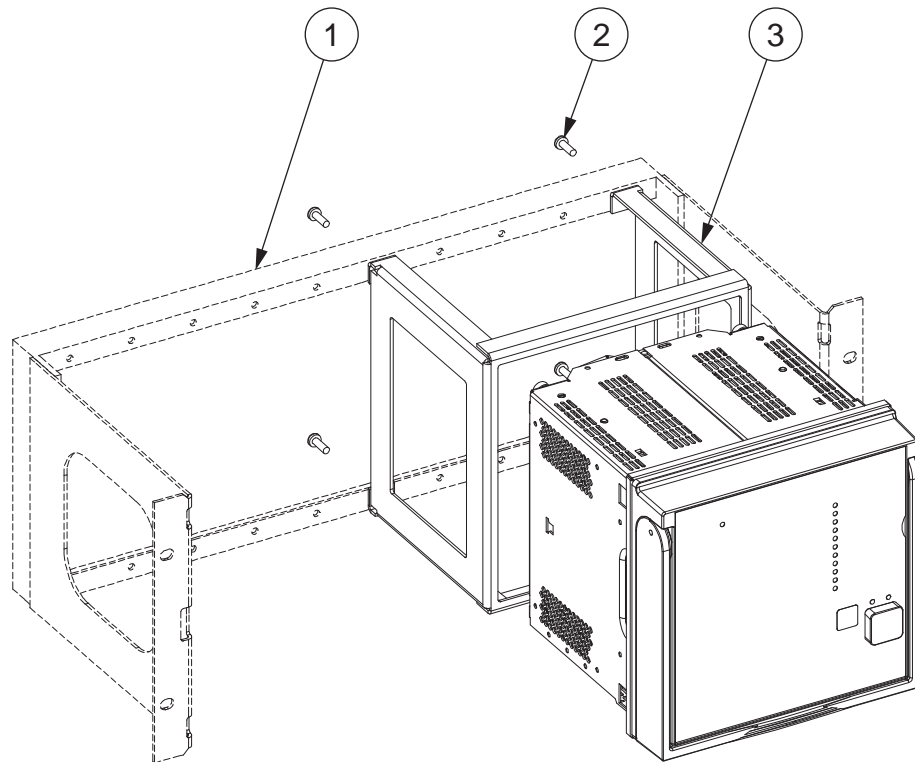


The type of mounting bracket to be used depends on whether the merging unit is installed into the frame on its own or with a test switch.

2. Loosen the four M5 fixing screws in the case to fit the case into the mounting bracket.
3. Mount the case to the mounting bracket.
4. Tighten the M5 screws.

The allowed range for the fixing screws' tightening torque is 0.7...1 Nm.

5. Install the plug-in unit into the case.



- 1 RHGT 19" 4U equipment frame,  
variant C, with support frame  
2 Tapping screw ST3.5x13

- 3 Mounting bracket

*Figure 23: Mounting the protection relay into a 19" combiflex equipment frame*

6. Install the optional RXP 18 or 24 test switch.

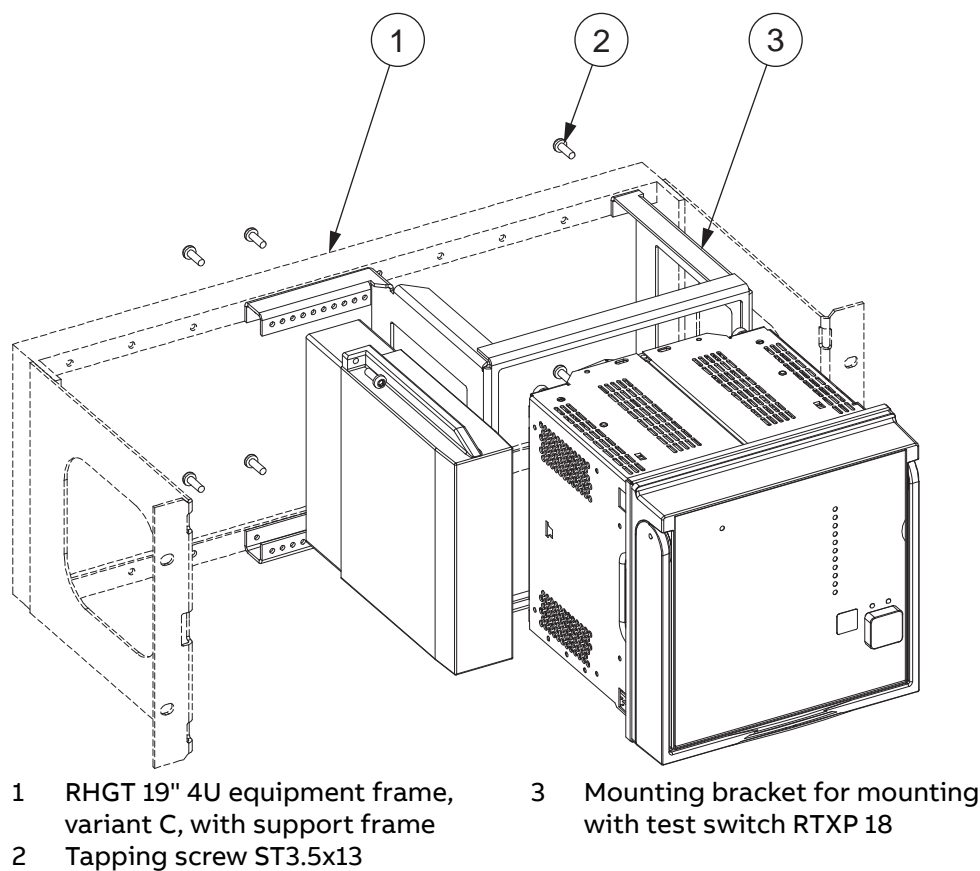


Figure 24: Merging unit and the test switch

### 4.3.9 Mounting lens sensors for an arc protection system

Arc protection is used to detect arc situations in air insulated metal-clad switchgear.

The arc protection system determines where in the switchgear cubicle the optional lens sensors are installed.

1. Drill a hole ( $\varnothing$  10 mm) in the wall of the supervised space.

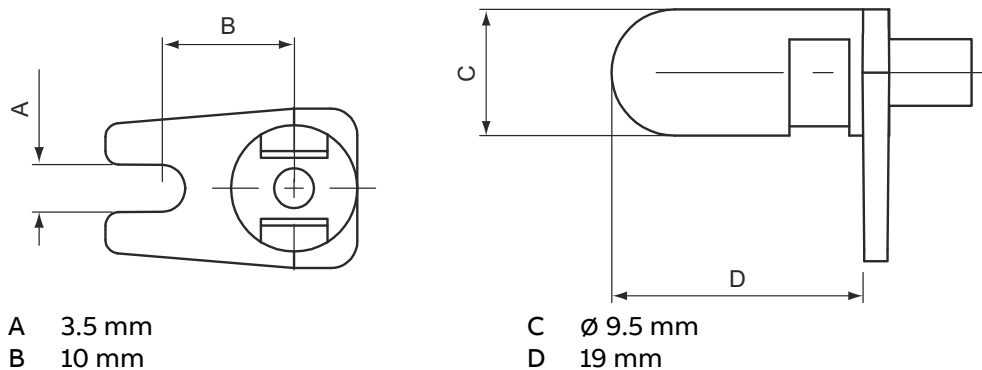
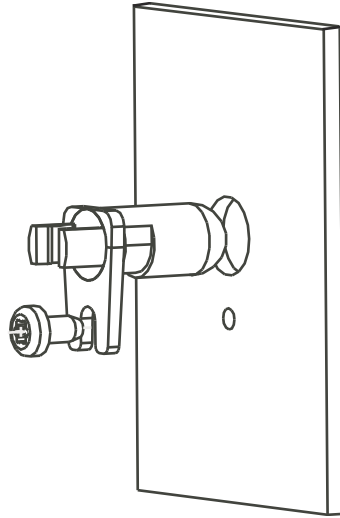


Figure 25: Dimensions of the lens sensor



2. Fit the lens sensor into the hole and fasten it with a self-tapping M3 screw. Alternatively, the lens sensor can be fastened with a cable tie. To do this, secure the cable tie to a suitable point of attachment on the cubicle wall and wrap the cable tie tightly around the sensor.



*Figure 26: Mounting the lens sensor*

3. Make sure that the cable tie lies in the groove of the sensor to prevent it from blocking the light.

## 5 Connecting

### 5.1 Required tools

Only use a screwdriver and insert bits for Phillips (PH 1) cross-recessed head screws (M3.5) when handling CT/ VT terminals (X120) of screw-compression type.

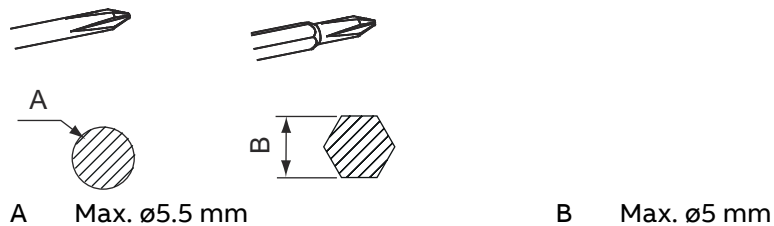


Figure 27: Screwdriver for CT/VT terminals of screw-compression type

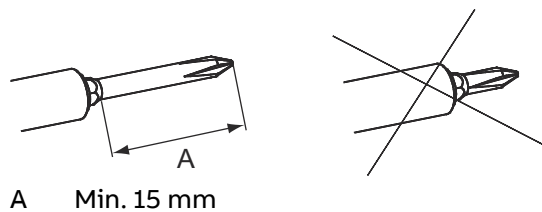


Figure 28: Insert bits for CT/VT terminals of screw-compression type

### 5.2 Connecting wires

All connections are made on the rear of the case. No soldering is needed.

- Open the screw-compression type terminals before inserting any wires. By default the terminals are closed at the time of delivery.
- Use fine wire in door mounting.



See the application manual for product-specific connection diagrams.

#### 5.2.1 Connecting ring-lug type wires

Ring-lug type insulated terminal can be used for signal connector X120. The maximum outside diameter for the M4 ring-lug type terminals is 9 mm.

## 5.3 Connecting protective earthing



The earth lead must be at least 6.0 mm<sup>2</sup>. If the earth lead is long, the cross section of the wire must be increased.



Use fine copper wire as the earth lead.

1. Loosen the protective earth screw (T20) to connect a separate earth protection lead.



The earth lead should be as short as possible but extra length is required for door mounting.



Each merging unit must have its own earth lead connected to the earth circuit connector.

2. Connect the earth lead to the earth bar.  
Use either stripped wire screwed between a washer cup and the protective earth screw or a ring lug.



Select a suitable ring lug to fit under the M4 screw.

3. Tighten the protective earth screw.
4. Support the earth lead so that it cannot break or weaken.  
Be aware of the mechanical, chemical and electrochemical environment.

## 5.4 Connecting analog signals

A connection diagram is needed to connect the analog signals.

When using the ring-lug type for CT/VT terminals, follow these steps.

1. Open the lid that covers the ring-lug fixing screw with the tip of a screwdriver.  
Every fixing screw has its own lid.
2. Remove the fixing screw.
3. Slide the screw through the terminal lug and screw it back on.
4. Close the lid.

### 5.4.1 Connecting current and voltage inputs

- Connect the wires from the CTs/VTs to the correct device according to the phase order and the connection diagram. Each terminal for CTs/VTs is dimensioned for one 0.5...6.0 mm<sup>2</sup> wire or for two wires of maximum 2.5 mm<sup>2</sup>.



SIM0002 and SIM0005 terminal X130 is dimensioned for one 0.5...2.5 mm<sup>2</sup> wire.



See the application manual for standard-configuration specific current and voltage inputs.

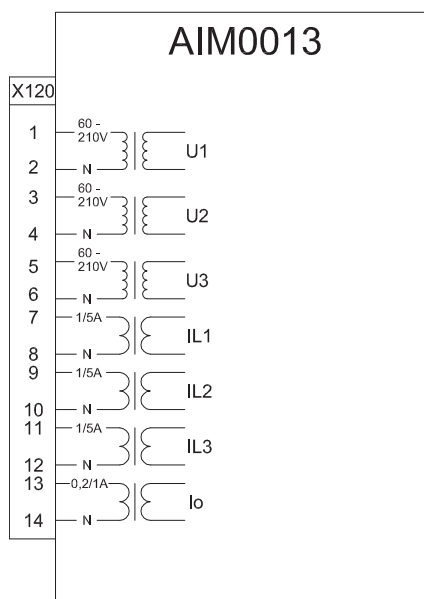


Figure 29: Example of AIM0013 card variant (4 I + 3 U with 0.2/1 A Io channel)

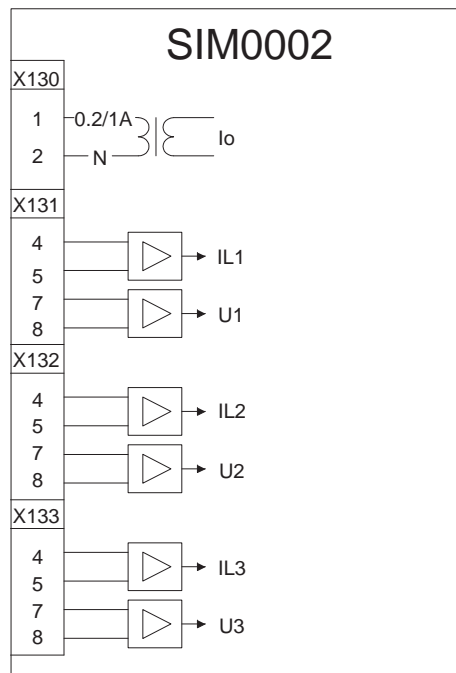


Figure 30: Example of SIM0002 card variant (4I+3U with 0.2/1 A  $I_0$  channel)

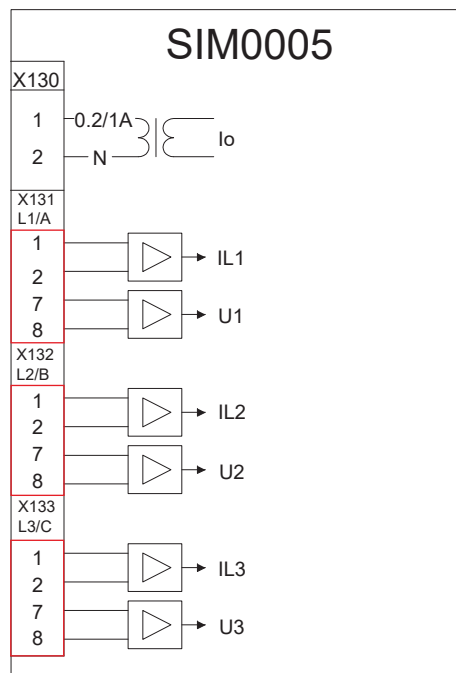


Figure 31: Example of SIM0005 card variant (4I+3U with 0.2/1 A  $I_0$  channel). Including red sensor connectors.

## 5.4.2 Connecting merging unit with a test switch

- When the merging unit is used with a test switch, connect the current and voltage transformers directly to the switch.

## 5.5 Connecting binary signals

- Connect the wires for the binary signals to the correct device according to the connection diagram. Each terminal for binary input and output signal is dimensioned for one 0.5...2.5 mm<sup>2</sup> wire or for two 0.5...1.0 mm<sup>2</sup> wires.



In addition to specific BIO cards, BI/O signals are available with some AIM and PSM cards. See the application manual for standard-configuration specific binary signal options.

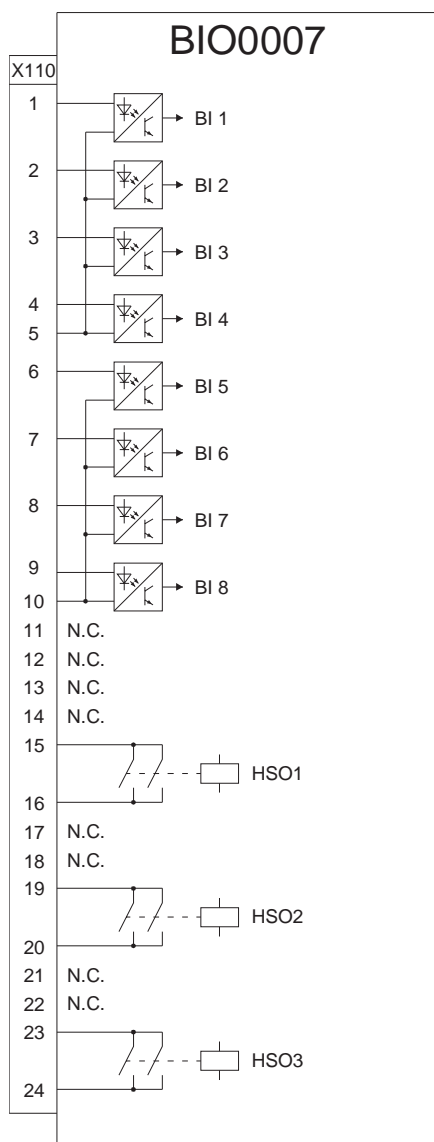


Figure 32: Example of BIO0007 card variant (8 BI + 3 BO)

## 5.6 Connecting power supply

The permitted auxiliary voltage range of the merging unit is marked on top of the merging unit's LHMI.

- Connect the merging unit's auxiliary voltage to terminals X100-1 and X100-2.
- Connect the positive lead to terminal X100-1.

## 5.7 Connecting communication

- Before connecting communication, check that the HW module has the correct communication interfaces.

The communication module is located on the left side of the merging unit when viewing the case from the rear.



See the technical manual for product-specific communication interfaces.

## 5.8 Energizing merging unit



Before connecting the auxiliary power, check that the protective film is removed from top of the merging unit.

- Before connecting the auxiliary power, check that the terminal strip is wired and placed correctly.
- Remove the protective film from the top side of the unit. Check that there is no debris visible in the ventilation holes.

During the start-up, all the LEDs are lit for a short period.

1. Green Ready LED starts to flash.
2. A steady green Ready LED indicates a successful start-up.

If the merging unit detects a diagnostic error during start-up, the green Ready LED flashes.

## **6 Removing, repairing and exchanging**

### **6.1 Product lifecycle**

At some point of the product lifecycle, the merging unit is upgraded to a next generation unit. When selecting the original product, already consider the upgrading and extension possibilities that the specific product offers for its whole lifecycle.

Merging unit specific options can be found from Retrofit Solutions Database on the Internet [www.abb.com](http://www.abb.com) by following the links within ABB Service Guide or via ABB Product Guide from the product specific Service & Support sheet.



## 6.2 Removing merging unit

1. Turn off the power.
2. Detach the plug-in unit from the case.
3. Disconnect the wiring.
4. Loosen the four M5 fixing screws.

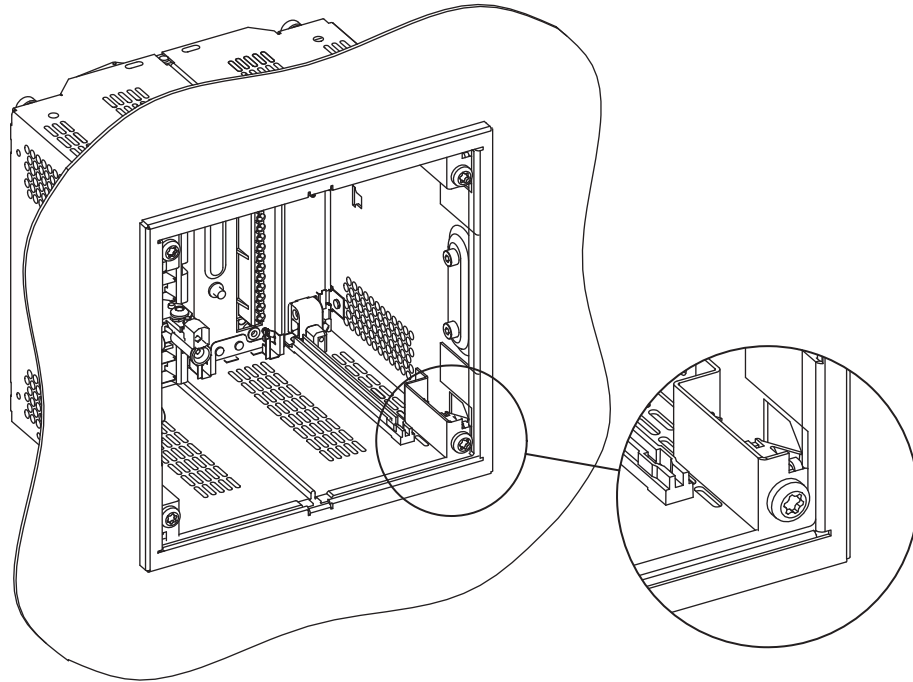


Figure 33: Loosening the M5 screws

5. Detach the case from the panel cut-out.

## 6.3 Sending merging unit for repair

- In case of product problems, contact the nearest ABB office or representative for consultation and instructions.

## 6.4 Exchanging merging unit

- To exchange the merging unit with another identical unit, remove the merging unit and install the new one.

The exchangeable units can be found from the PartsOnLine system, see [www.abb.com/partsonline](http://www.abb.com/partsonline). Use of PartsOnLine requires user registration.

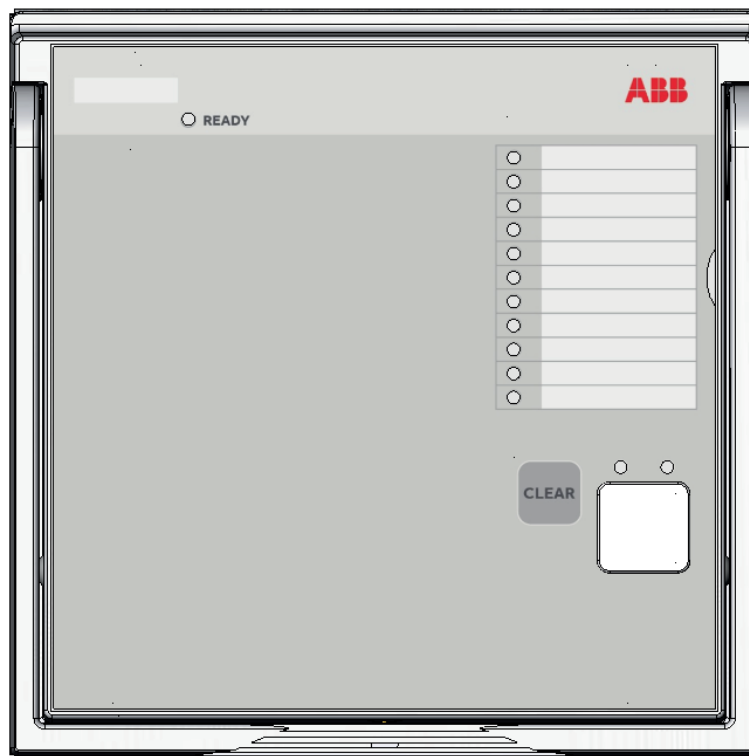
- To exchange a merging unit to a different unit, change the case and connect the wires.
- When replacing only the plug-in unit for maximum system availability, check that the order number of the case and the spare plug-in unit are equal to ensure the type compatibility.

The serial numbers of the original case and the spare plug-in unit are temporarily mismatched. For matching the serial numbers, replace also the case of the spare unit as soon as possible, for example, during the next scheduled maintenance break.

## 7 Technical data

### 7.1 Case and HMI display variants

#### 7.1.1 Front side of the merging unit



*Figure 34: Front view of the merging unit*

## 7.1.2 Rear side of the merging unit

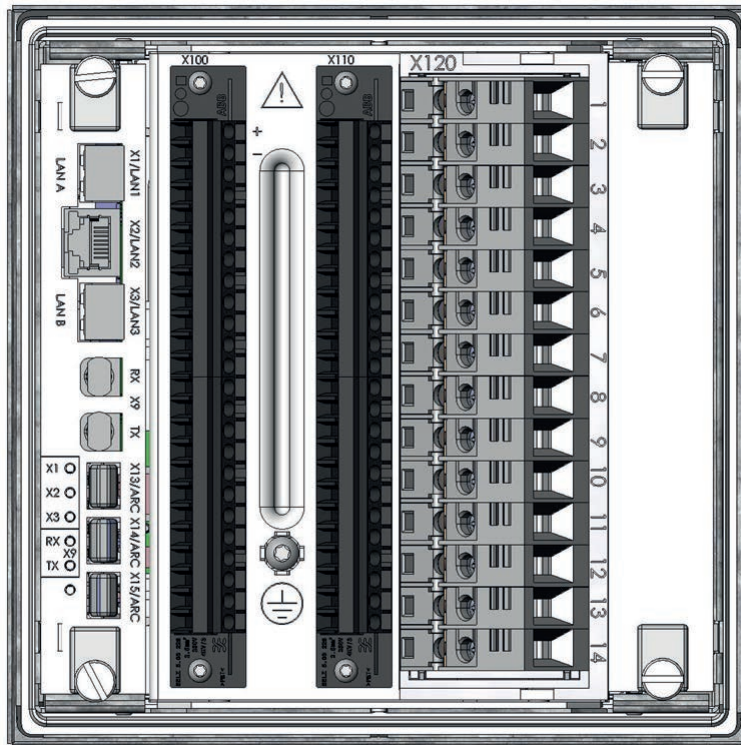


Figure 35: Rear view of a merging unit with communication module, BIO and AIM

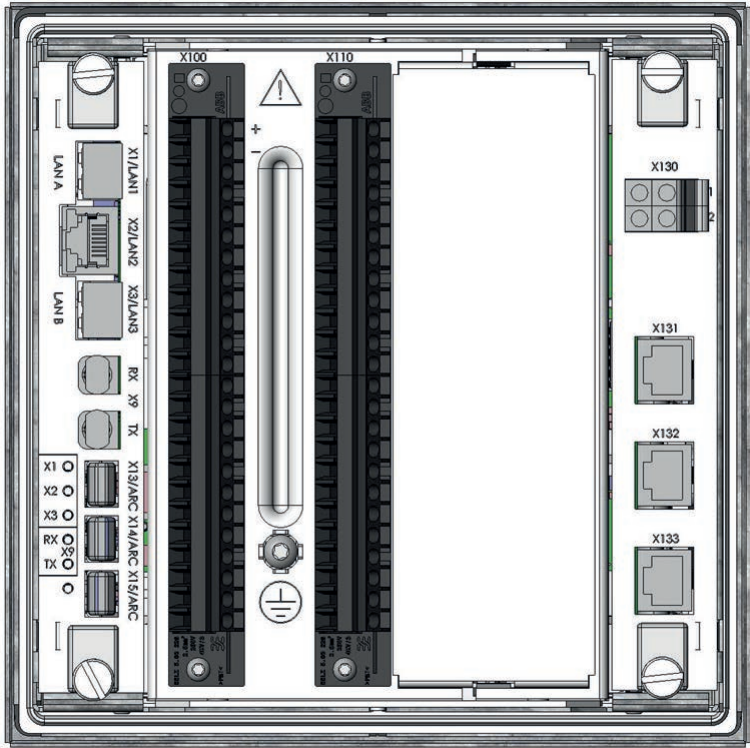
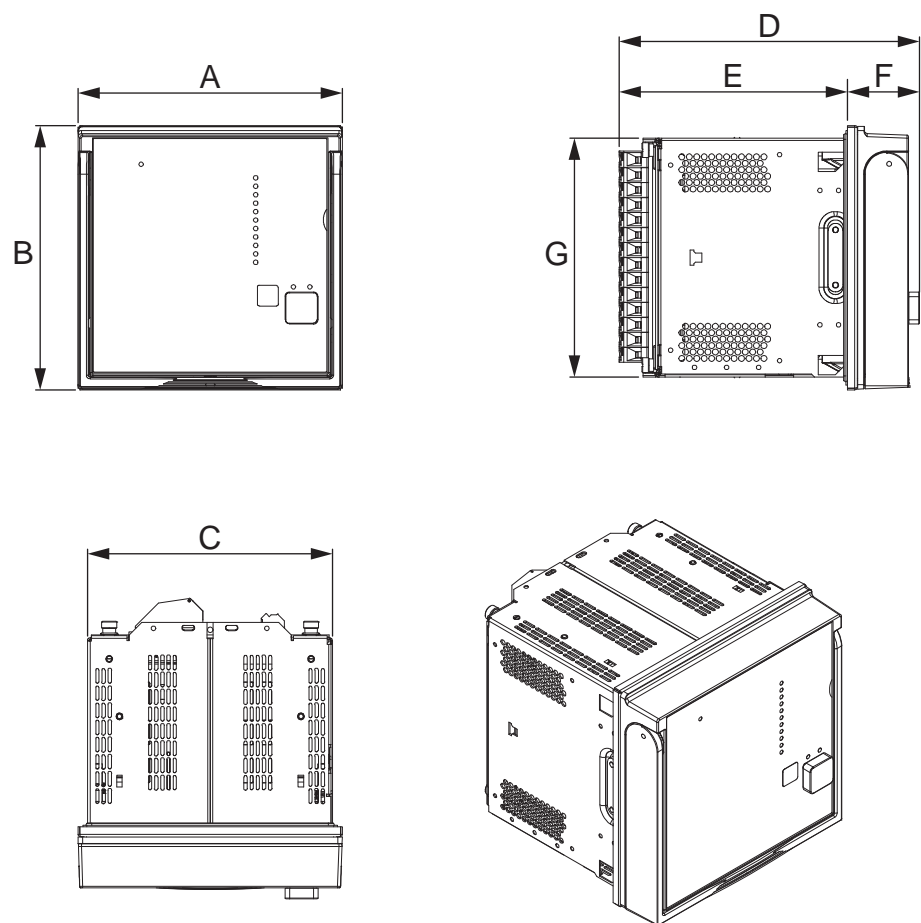


Figure 36: Rear view of a merging unit with communication module, BIO and SIM

# 7.2 Dimensions



- A 177 mm
- B 177 mm (4U)
- C 164 mm
- D 201 mm
- E 153 mm
- F 48 mm
- G 160 mm

Figure 37: Main dimensions

Table 3: Dimensions

Description	Value	
Width	Frame	177 mm
	Case	164 mm
Height	Frame	177 mm (4U)
	Case	160 mm
Depth		201 mm (153 + 48 mm)
Weight	Complete merging unit	4.1 kg
	Plug-in unit only	2.1 kg

## 7.3 Enclosure class

**Table 4: Degree of protection of flush-mounted merging unit**

Description	Value
Front side	IP 54
Rear side, connection terminals	IP 20

## 8 Accessories and ordering data

**Table 5: Cables**

Item	Order number
Optical sensor for arc protection, cable length 1.5 m	1MRS120534-1.5
Optical sensor for arc protection, cable length 3.0 m	1MRS120534-3
Optical sensor for arc protection, cable length 5.0 m	1MRS120534-5
Optical sensor for arc protection, cable length 7.0 m	1MRS120534-7
Optical sensor for arc protection, cable length 10.0 m	1MRS120534-10
Optical sensor for arc protection, cable length 15.0 m	1MRS120534-15
Optical sensor for arc protection, cable length 20.0 m	1MRS120534-20
Optical sensor for arc protection, cable length 25.0 m	1MRS120534-25
Optical sensor for arc protection, cable length 30.0 m	1MRS120534-30

**Table 6: Mounting accessories**

Item	Order number
Semi-flush mounting kit	1MRS050696
Wall mounting kit	1MRS050697
Inclined semi-flush mounting kit	1MRS050831
19" rack mounting kit with cut-out for one merging unit	1MRS050694
19" rack mounting kit with cut-out for two merging units	1MRS050695
Mounting bracket for one merging unit with test switch RTXP in 4U Combiflex (RHGT 19" variant C)	2RCA022642P0001
Mounting bracket for one merging unit in 4U Combiflex (RHGT 19" variant C)	2RCA022643P0001
19" rack mounting kit for one merging unit and one RTXP18 test switch (the test switch is not included in the delivery)	2RCA021952A0003
19" rack mounting kit for one merging unit and one RTXP24 test switch (the test switch is not included in the delivery)	2RCA022561A0003



## 9 Glossary

AIM	Analog input module
BI/O	Binary input/output
BIO	Binary input and output
CT	Current transformer
EMC	Electromagnetic compatibility
IEC	International Electrotechnical Commission
LCP	Liquid crystal polymer
LED	Light-emitting diode
LHMI	Local human-machine interface
PA	Polyamide
PBT	Polybutylene terephthalate
PC	1. Personal computer 2. Polycarbonate
PSM	Power supply module
RoHS	Restriction of hazardous substances
VT	Voltage transformer



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