RELION® PROTECTION AND CONTROL

620 series

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 protection relay 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 relay case internals may contain high voltage potential and touching these may cause personal injury.

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

Whenever changes are made in the protection relay, 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 protection relay. The manual provides procedures for mechanical and electrical installation. The chapters are organized in the chronological order in which the relay 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

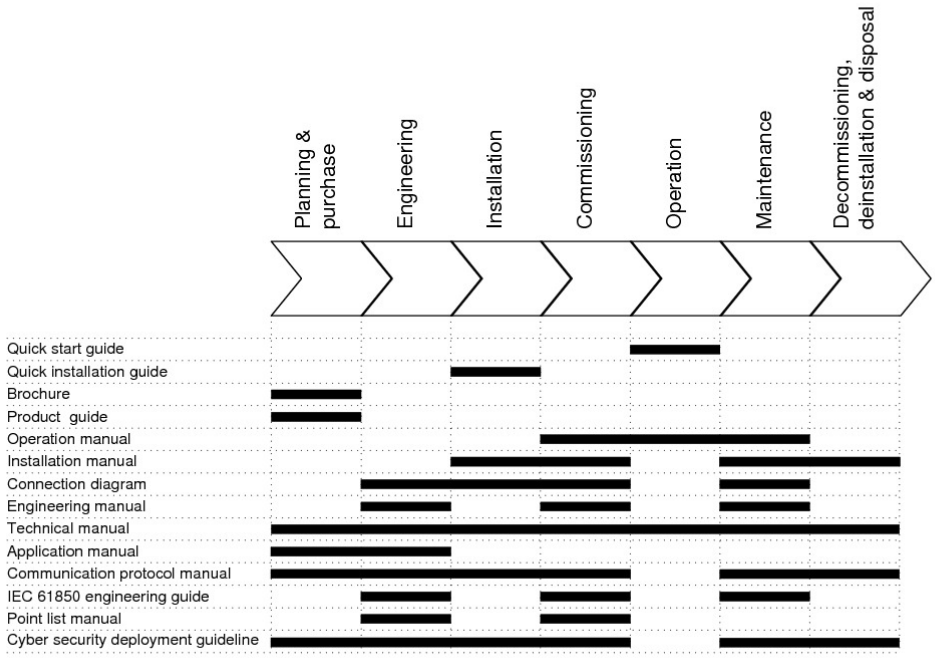


Figure 1: The intended use of documents during the product life cycle

Product series- and product-specific manuals can be downloaded from the ABB Web site *www.abb.com/relion*.

1.3.2 Document revision history

Document revision/date	Product version	History
A/2013-05-07	2.0	First release
B/2014-07-01	2.0	Content updated
C/2014-09-11	2.0	Content updated
D/2015-12-11	2.0 FP1	Content updated to correspond to the product series version

Table continues on the next page

Document revision/date	Product version	History
E/2018-08-31	2.0 FP1	Content updated
F/2019-06-19	2.0 FP1	Content updated
G/2021-12-20	2.0 FP1	Content updated

Download the latest documents from the ABB Web site *http://www.abb.com/substationautomation*.

1.3.3 Related documentation

Product series- and product-specific manuals can be downloaded from the ABB Web site *http://www.abb.com/substationautomation*.

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.
- Push-button navigation in the LHMI menu structure is presented by using the push-button icons.

  To navigate between the options, use and .
- Menu paths are presented in bold.

  Select **Main menu** > **Settings**.
- LHMI messages are shown in Courier font.

  To save the changes in nonvolatile memory, select `Yes` and press .
- 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.

  When the function starts, the `START` output is set to TRUE.
- 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 protection relay.

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 protection relay

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 protection relay 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 protection relay parts

Protection relay	Parts	Material
Case	Metallic plates, parts and screws	Steel
	Plastic parts	PC , LCP
	Electronics plug in module	Various
Plug-in unit	Electronics plug in modules	Various
	Electronics LHMI module	Various
	Plastic parts	PC, PBT, LCP, PA
	Metallic parts	Aluminium
Package	Box	Cardboard
Attached material	Manuals	Paper

[1] Polycarbonate
[2] Liquid crystal polymer
[3] Polybutylene terephthalate
[4] Polyamide

3 Unpacking, inspecting and storing

3.1 Removing transport packaging

Protection relays 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 protection relay) on the top side of the unit for the installation phase.

Before connecting the auxiliary power, remove the protective film from top of the protection relay.

The cardboard packaging material is 100% recyclable.

3.2 Inspecting product and delivery items

3.2.1 Identifying product

1. Locate the protection relay's order number from the label on top of the plug-in unit.
2. Compare the protection relay'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

Protection relays require careful handling before installation on site.

- Check the protection relay to see if any damage occurred during transportation.

If the protection relay 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 protection relay 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 protection relay to allow access to wires and optical fibers to provide sufficient ventilation to the protection relay and to enable maintenance and future modifications.
- Ensure that flush-mounted protection relays 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.

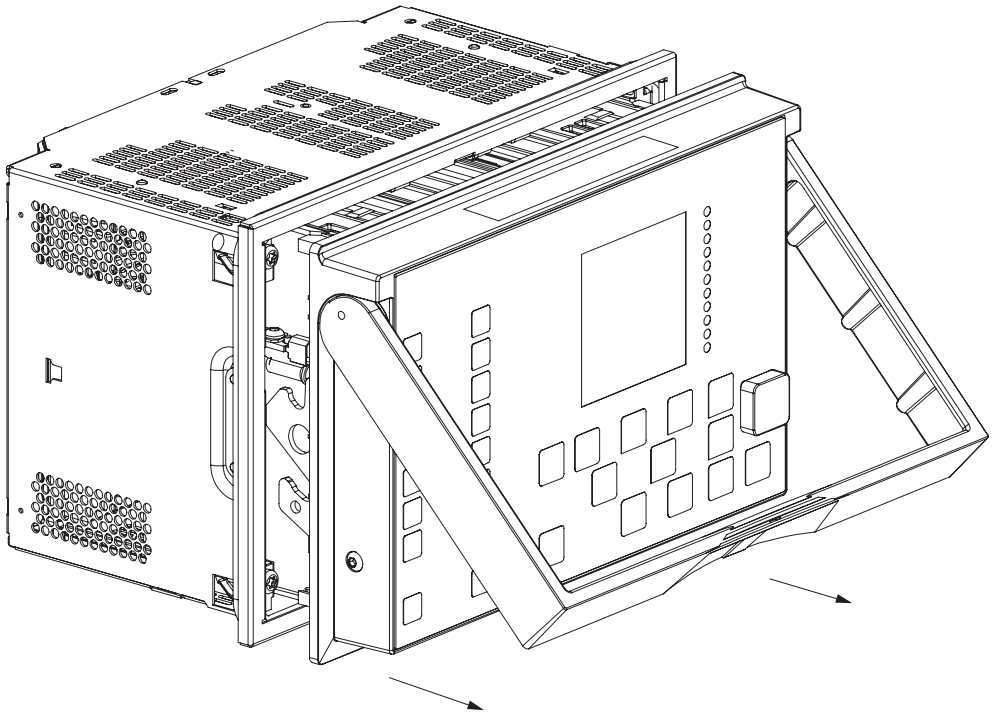


Figure 2: Detaching a plug-in unit from the case

The protection relay 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.

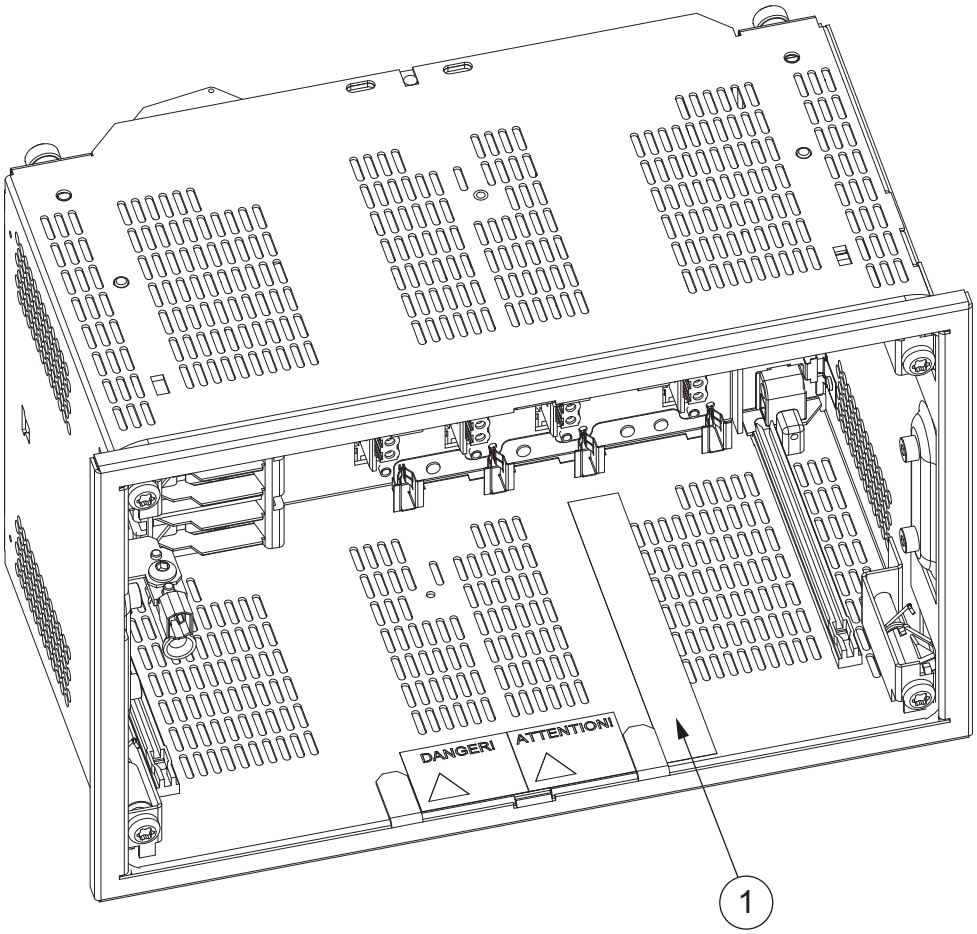
Do not touch terminals inside the case after removing the plug-in unit. Live terminals can be inside the case.

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

4.2.2 Installing plug-in unit

The protection relay 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.

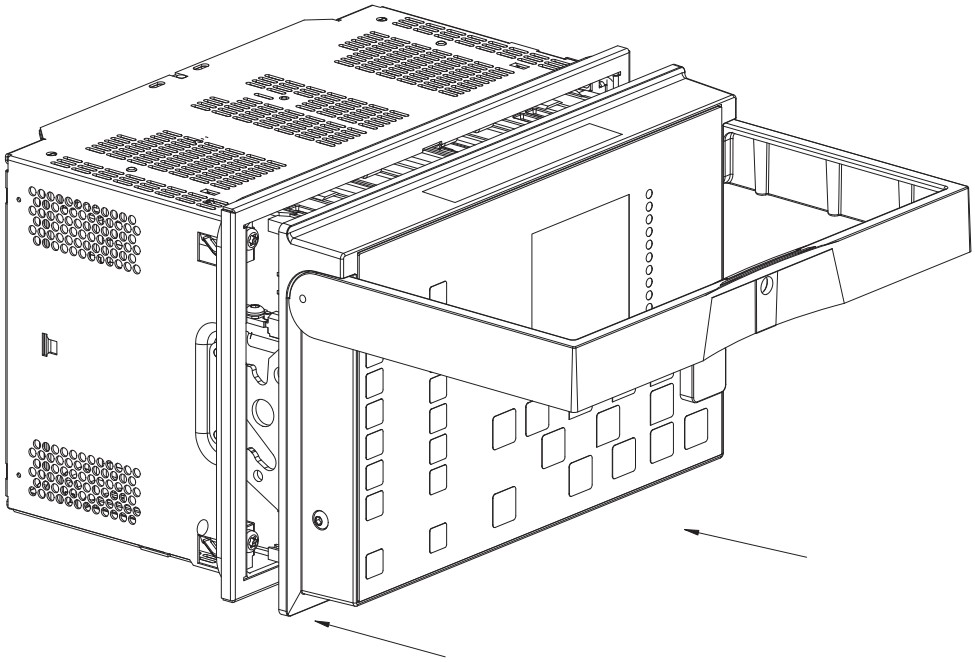
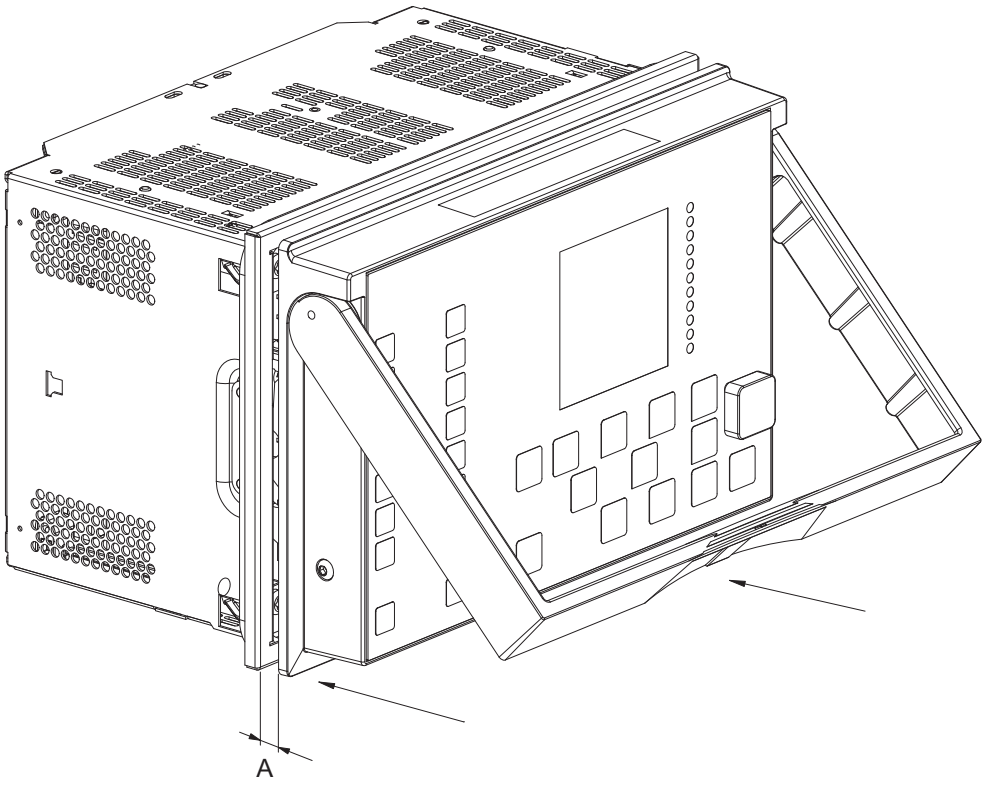


Figure 4: Installing a plug-in unit into the case

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

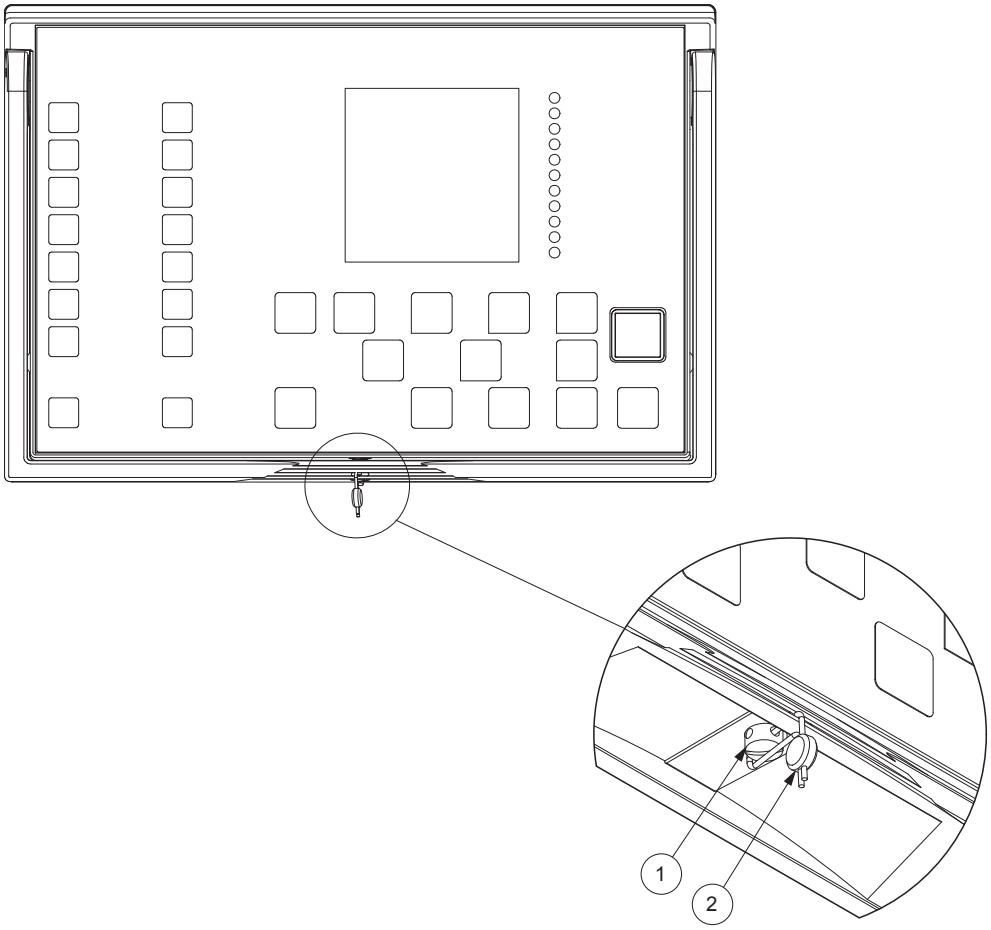
3. Turn down the handle to push the plug-in unit into its final position in the case.

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 protection relay 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

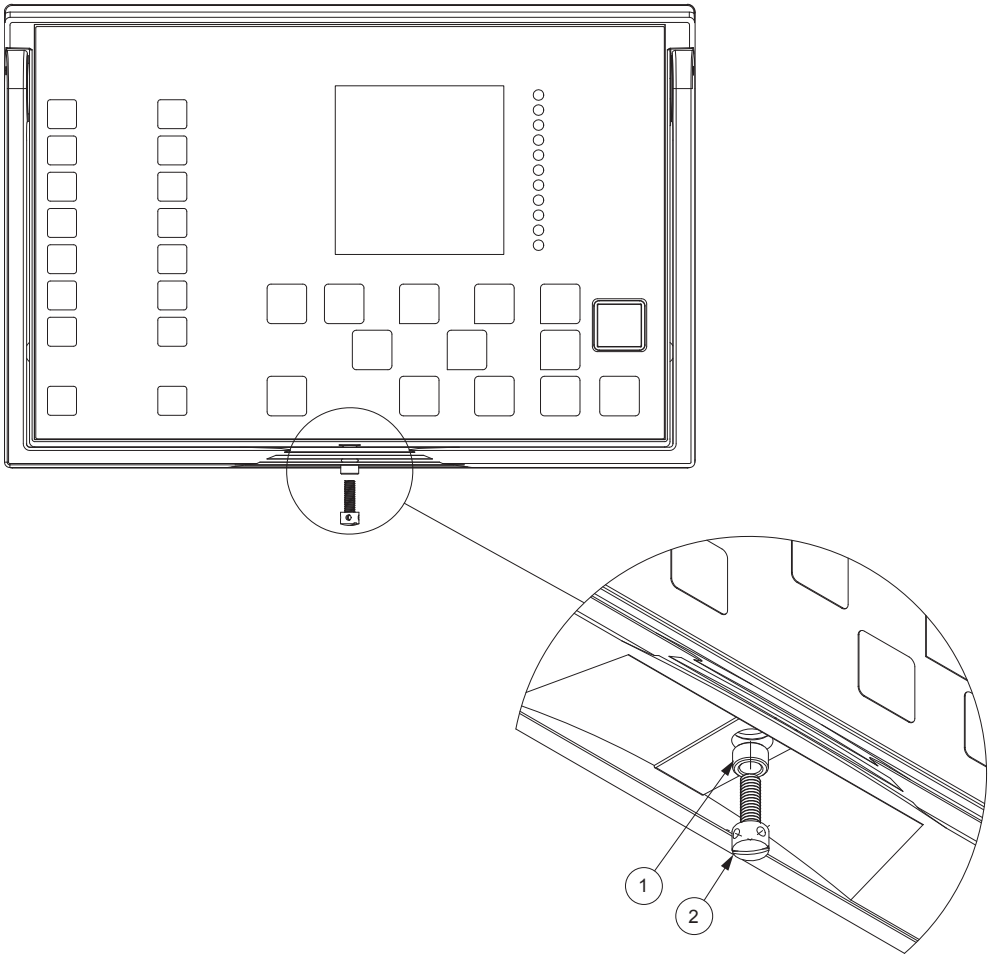
Figure 6: Sealing screw

4.2.4 Securing handle

The front panel of the protection relay 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 protection relay 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 protection relay 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 the protection relay

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 the protection relay

All the mounting elements are integrated in the protection relay.

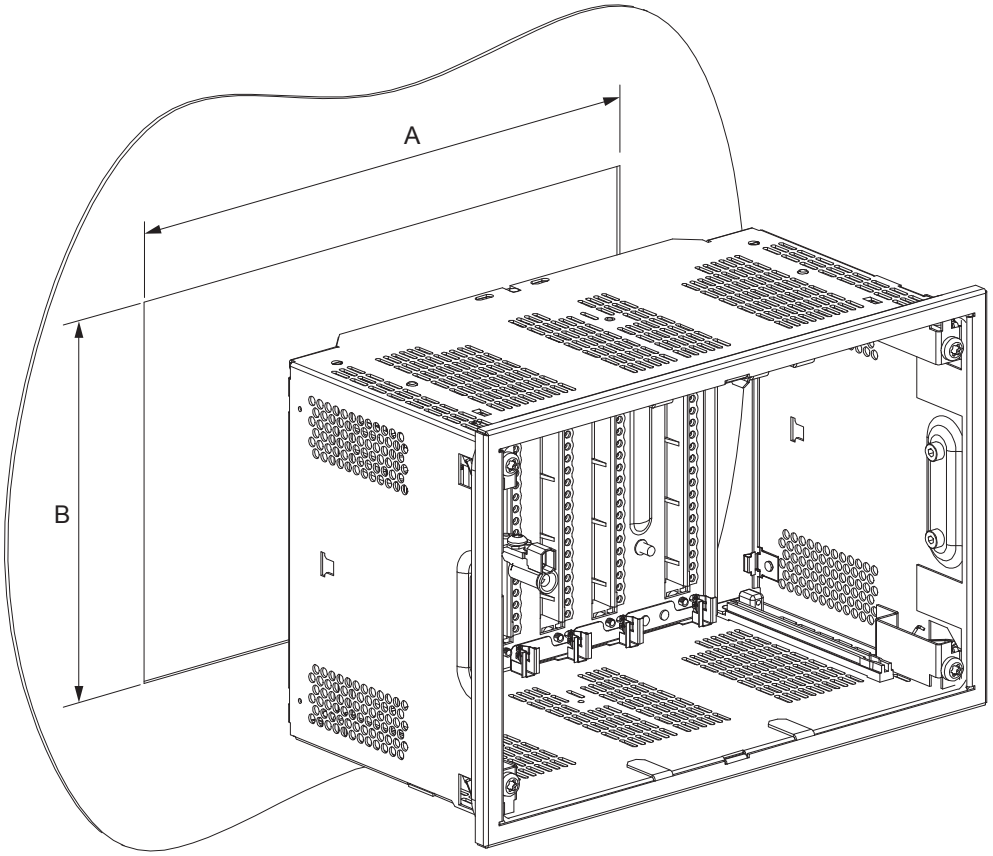
Requirements for installation:

- Panel cut-out of 248 × 162 mm
- Depth behind the panel 153 mm

A protection relay 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 248 ±1 mm B 162 ±1 mm

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.

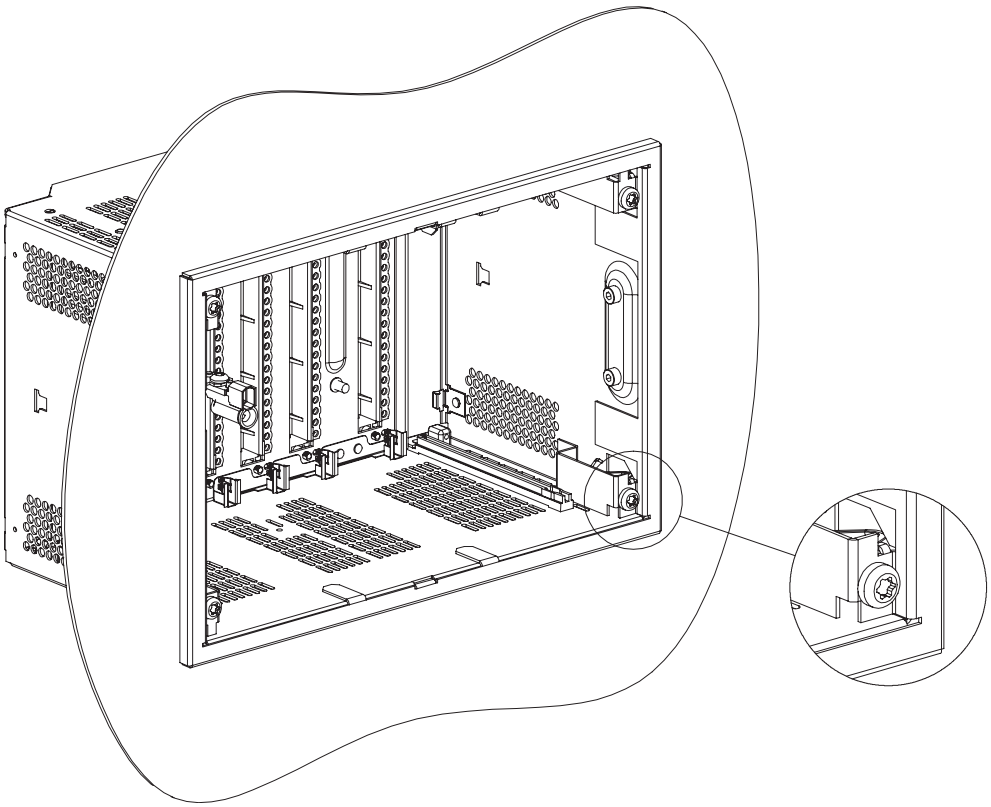
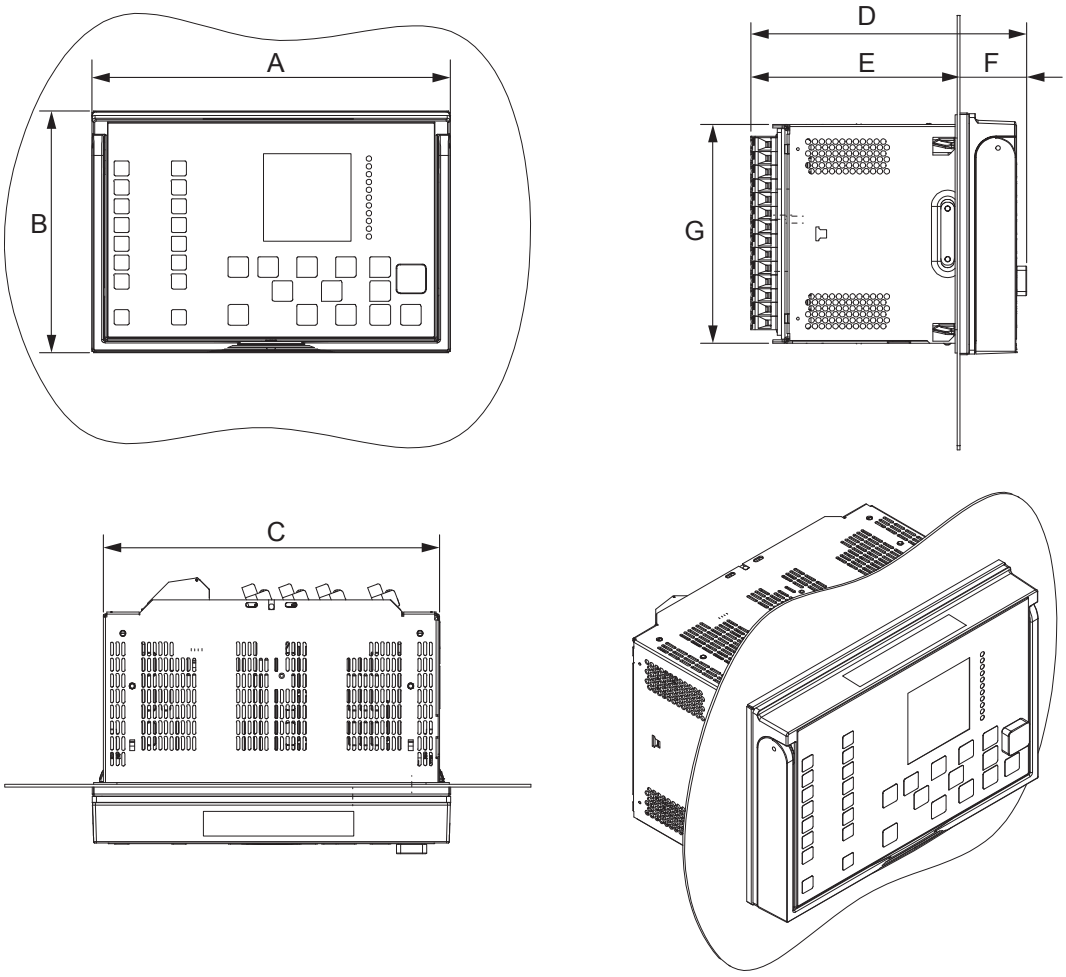


Figure 9: Flush mounted case, tightening the M5 fixing screws

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

   There is a protective film on the top side of the protection relay. Its purpose is to prevent debris falling inside the unit while installing electrical wiring. Remove the protective film before energizing the protection relay.



A	262.2 mm	E	153 mm
B	177 mm	F	48 mm
C	246 mm	G	160 mm
D	201 mm		

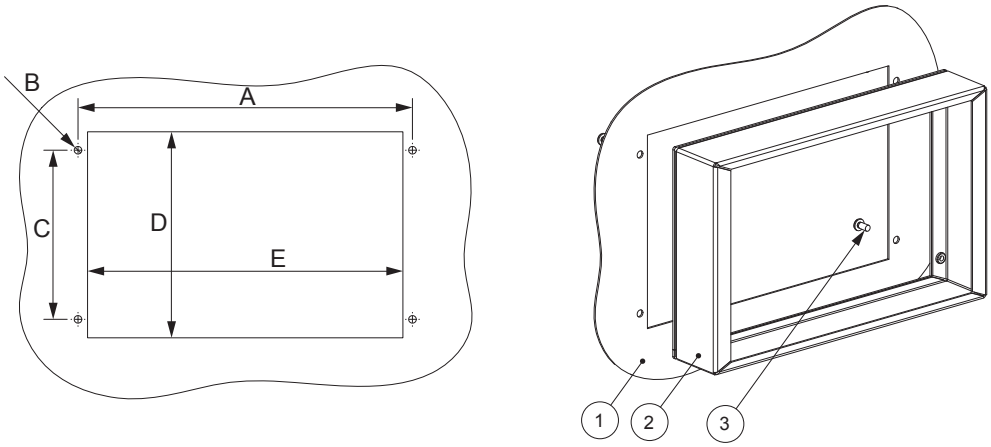
Figure 10: Flush mounted case and plug-in unit

4.3.3 Semi-flush mounting the protection relay

A mounting kit is needed for semi-flush mounting the protection relay. The mounting kit includes screws, a raising frame and gasket.

To install a semi-flush, a panel cut-out of 248 x 162 mm with mounting holes and 103 mm depth behind the panel is required.

1. Mount the raising frame into the panel cut-out with four M5 screws.



A	263 ±0.5 mm	E	248 ±1 mm
B	Ø 6 mm	1	Panel
C	133 ±0.5 mm	2	Raising frame
D	162 ±1 mm	3	M5 screw

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.

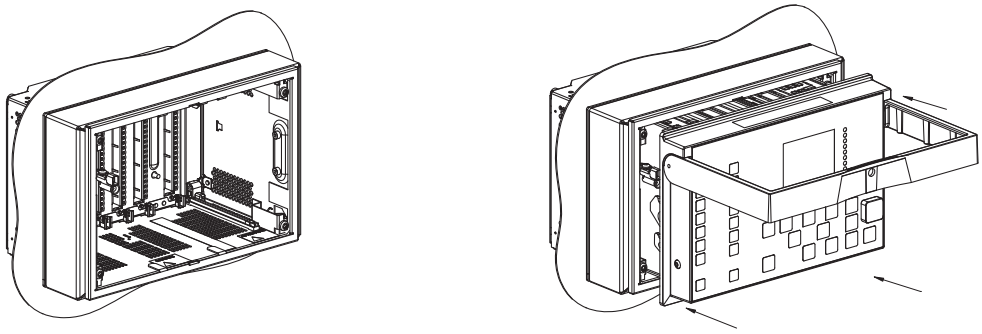


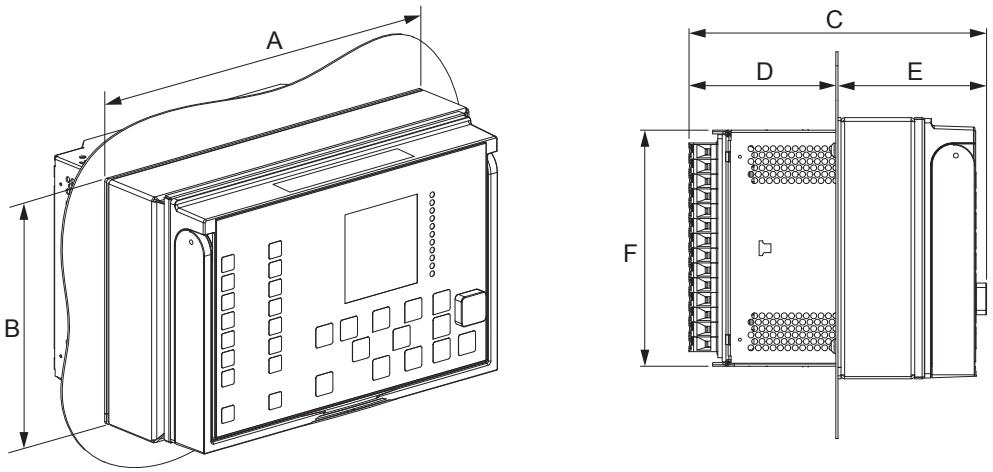
Figure 12: Mounting the case

5. Tighten the M5 screws.

The allowed range for the fixing screw's 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 IED.



A	280 mm	D	103 mm
B	177 mm	E	98 mm
C	201 mm	F	160 mm

Figure 13: Semi-flush mounted the protection relay

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

4.3.4 Semi-flush mounting the protection relay inclined

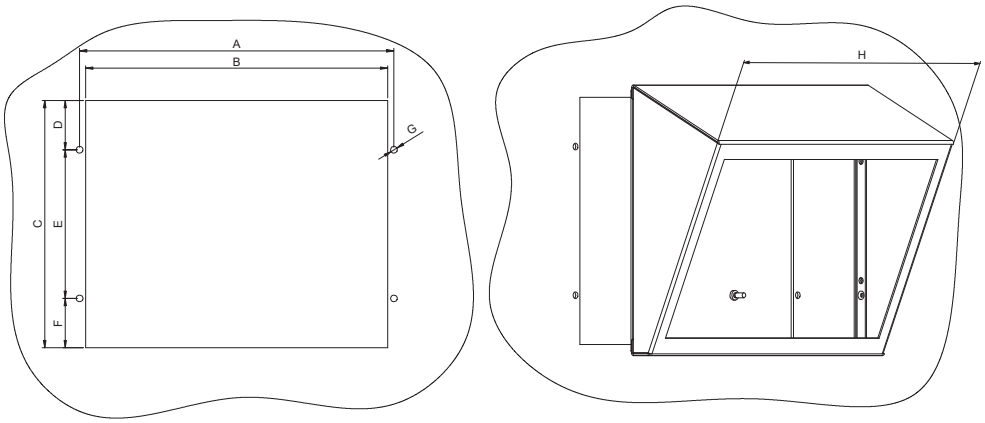
A mounting kit is needed for semi-flush mounting the protection relay inclined. In addition to the detailed mounting instructions, the mounting kit includes:

- Angle frame
- Gasket
- Screws

Requirements for installation

- Panel cut-out of 248 × 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.



A	258 ±0.2 mm	E	122 mm
B	248 ±1 mm	F	40.5 mm
C	203 ±1 mm	G	Ø 5.5 mm
D	40.5 mm	H	272 mm

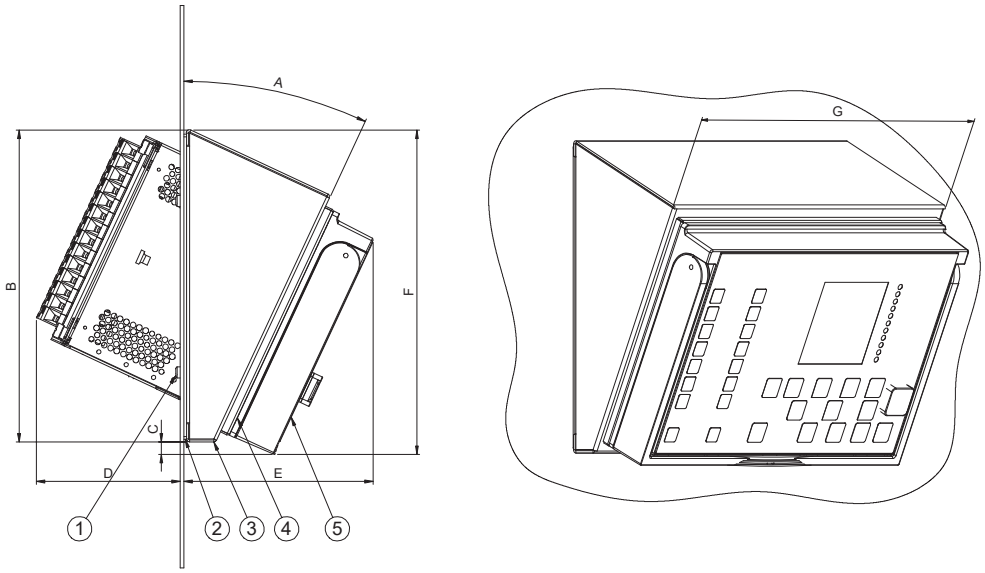
Figure 14: Mounting the angled frame

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 protection relay can be mounted inclined downward to a 25° angle.

4. Tighten the screws.

The allowed range for the fixing screw`s tightening torque is 0.7...1 Nm.

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



A	25 °	G	272 mm
B	222 mm	1	M4 screws
C	9 mm	2	Gasket
D	105 mm	3	Angled frame
E	135 mm	4	Case
F	230 mm	5	Plug-in unit

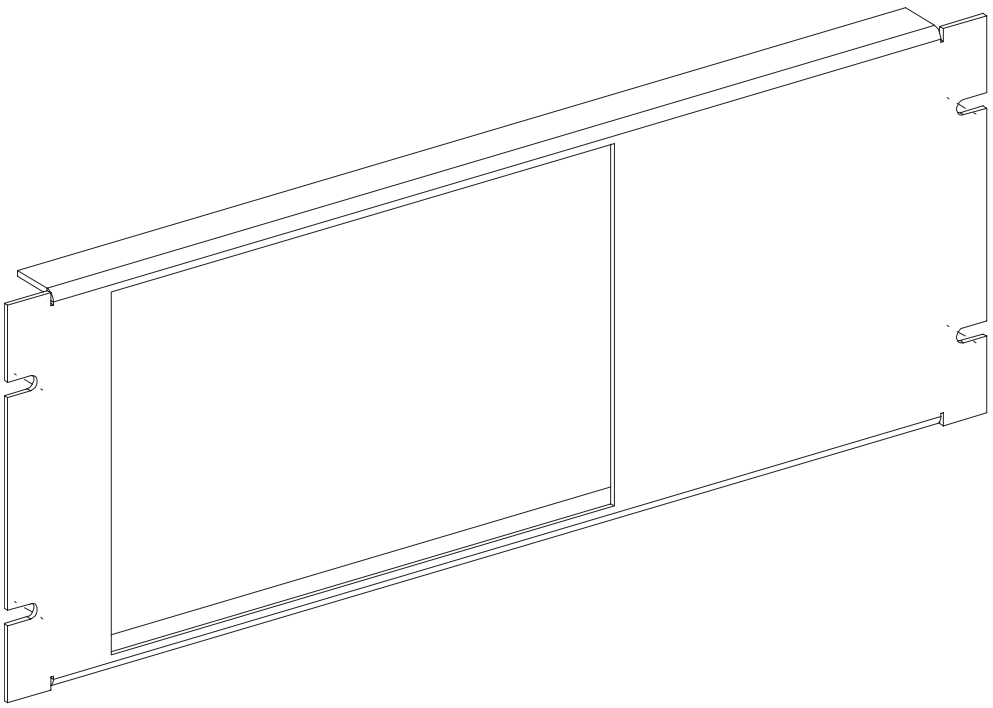
Figure 15: Protection relay semi-flush mounted inclined

4.3.5 Rack mounting the protection relay

A mounting kit is needed for rack mounting the protection relay. The 19" rack mounting kit includes screws and a mounting panel.

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.



A 482.6 mm (19") B 177 mm (4U)

Figure 16: 19” rack mounting panel, height 4U

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.

   There is a protective film on the top side of the protection relay. Its purpose is to prevent debris falling inside the unit while installing electrical wiring. Remove the protective film before energizing the protection relay.

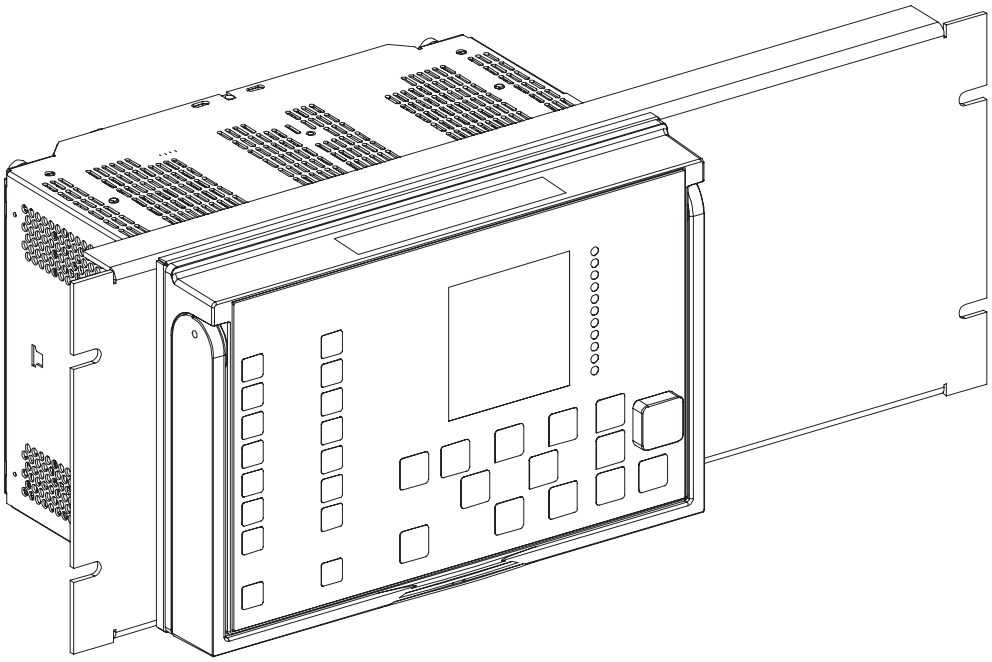
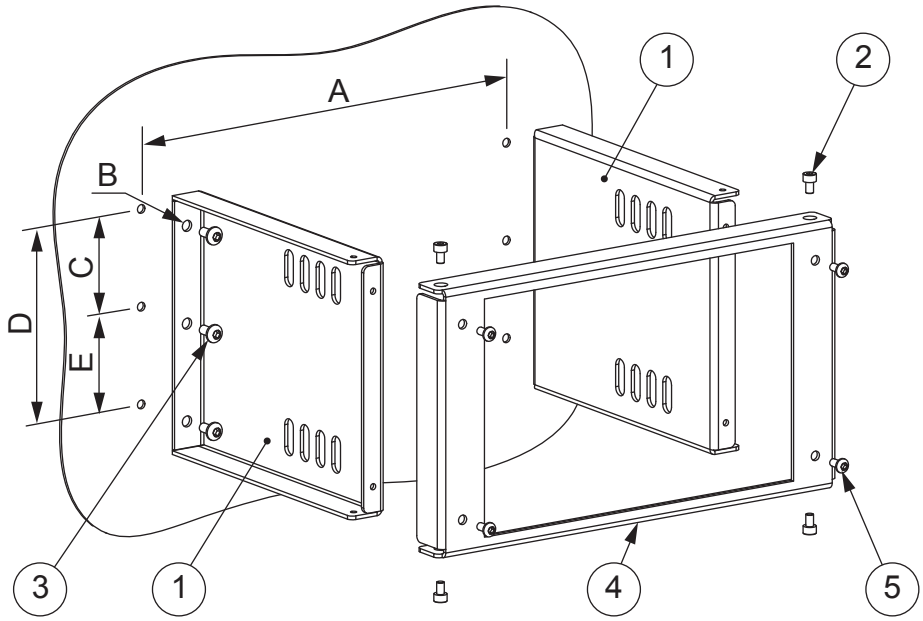


Figure 17: Rack mounted protection relay

4.3.6 Wall mounting the protection relay

A mounting kit is needed for wall mounting the protection relay.



A	293 mm	1	Side part (2 pieces)
B	Ø 7.5 mm	2	Hexagon socket head cap screw M5x8 (4 pieces)
C	66.5 mm	3	Wall mounting screws (not included)
D	133 mm	4	Front part
E	66.5 mm	5	Torx screw M5x10 (4 pieces)

Figure 18: Wall-mounting kit

1. Drill screw holes according to the dimensional drawing.
2. Mount the side parts with M6 screws (screws not included).
3. Mount the front part with the included M5 screws.

4. Detach the plug-in unit from the case and mount the case to the front part by tightening the integrated mounting screws 0.7...1.0 Nm.

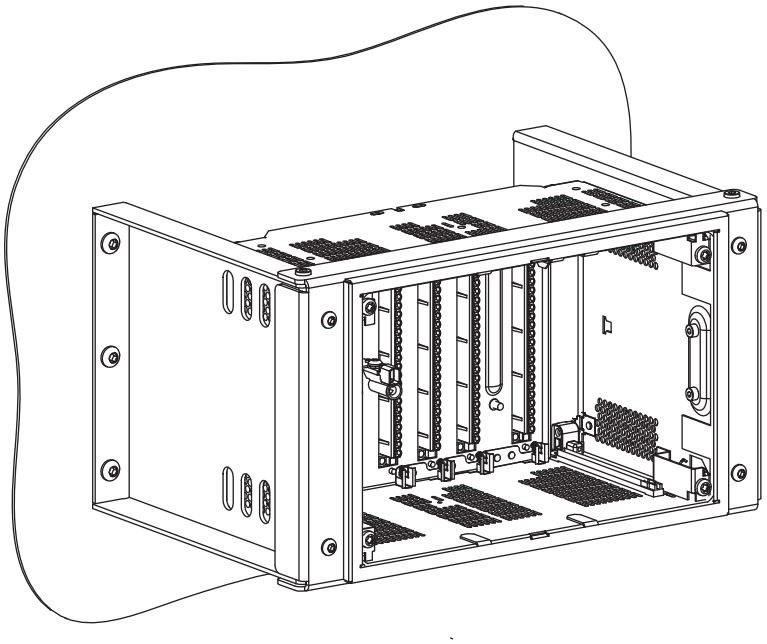
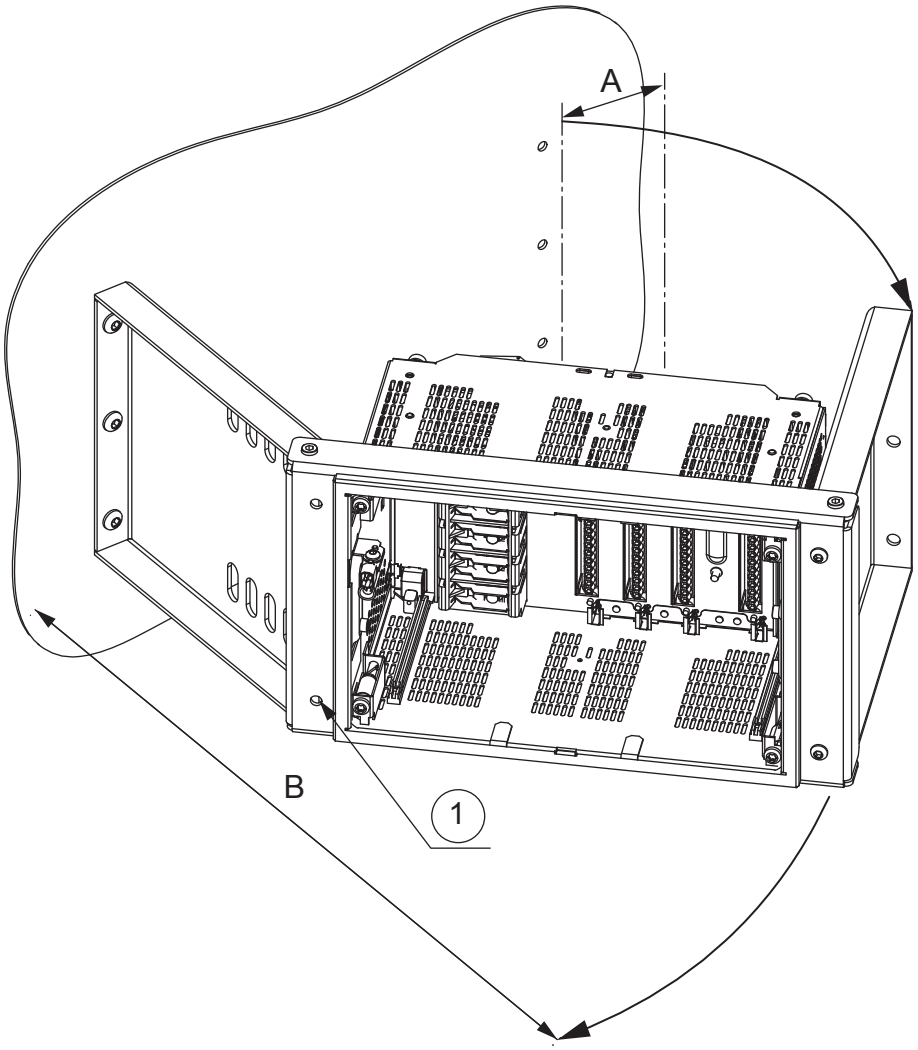


Figure 19: Mounting the case

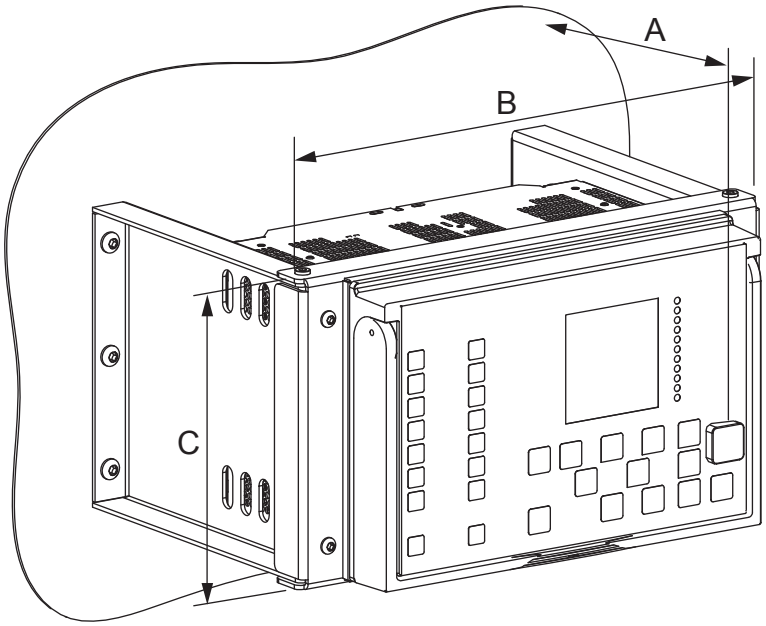
5. The frame can be swung out to access terminals for wiring. Remove the screws as seen to swing out the frame.



A 57 mm
B 503 mm
1 Remove the screws before swinging out the frame

Figure 20: Swing mechanism

6. After finished wiring, turn the frame to the wall again and insert all removed screws.
7. Install the removed plug-in unit.



A 259 mm
B 318 mm
C 186 mm

Figure 21: Wall-mounted protection relay

Leave enough slack to wires and cables to allow installation movement.

4.3.7 Rack mounting the protection relay and test switch RTXP to a 19” equipment frame

A mounting kit is needed for rack mounting the protection relay in a 19" equipment frame. The mounting kit includes a mounting panel and a metallic frame for mounting the RTXP 24 test switch to the panel.

The protection relay 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 24 test switch to the panel.

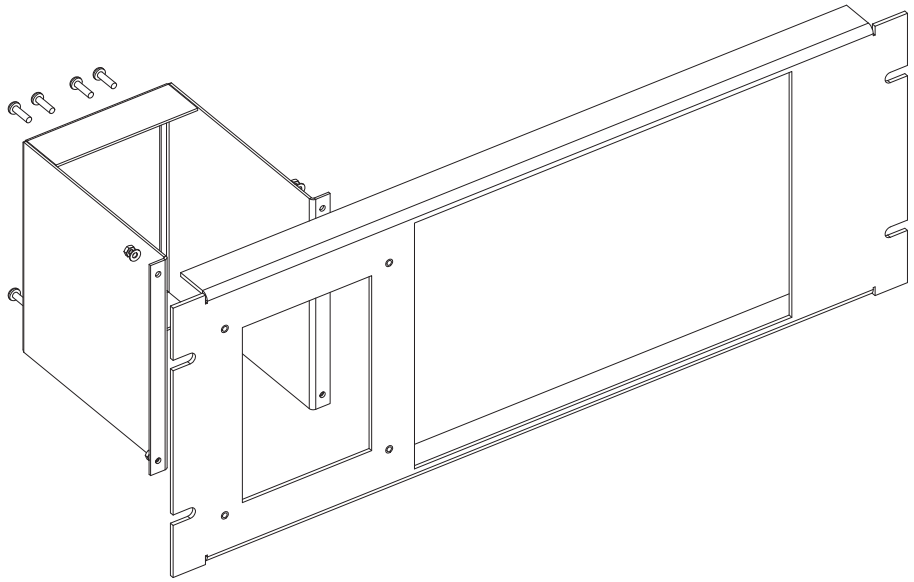


Figure 22: Mounting kit for the protection relay and an RTXP 24 test switch

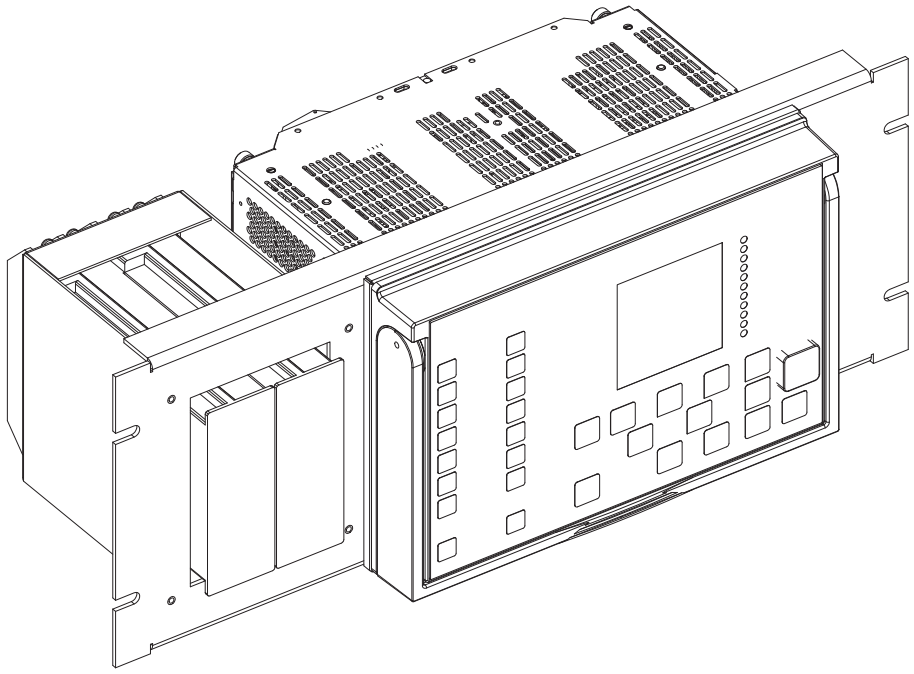


Figure 23: protection relay and the test switch RTXP 24 mounted into a 19" equipment panel

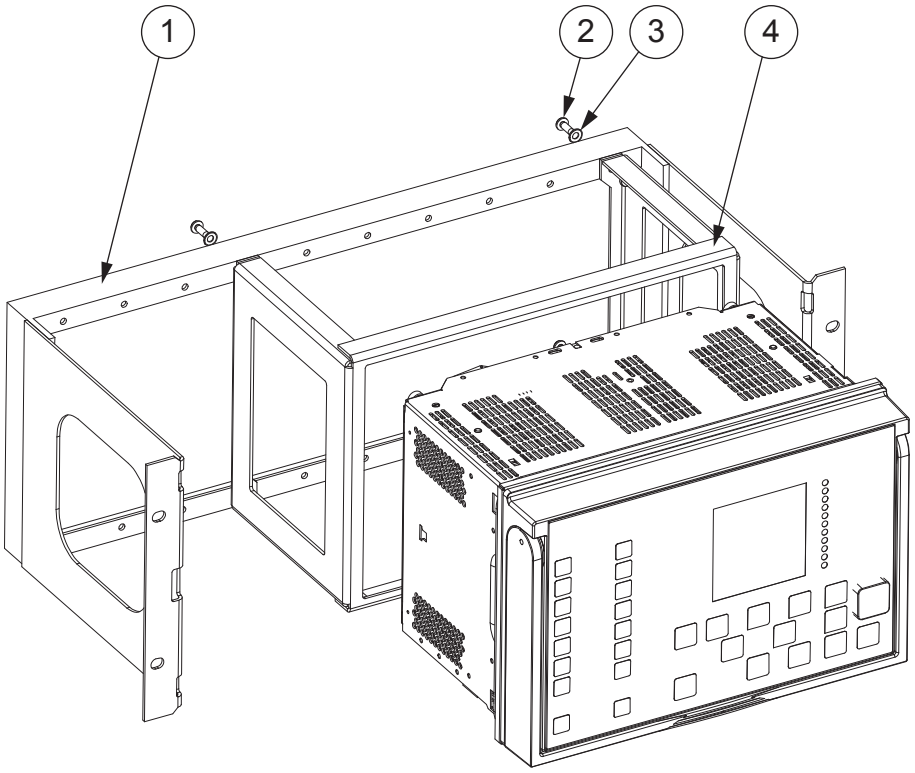
4.3.8 Rack mounting the protection relay in a combiflex 19" equipment frame (Type RHGT 19" 4U variant C)

A mounting bracket is needed for rack mounting the protection relay into a combiflex 19" equipment frame. The mounting kit includes a mounting bracket for the case.

1. Install the mounting bracket into the combiflex equipment frame by using M4 ×10 screws from rear side.
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.

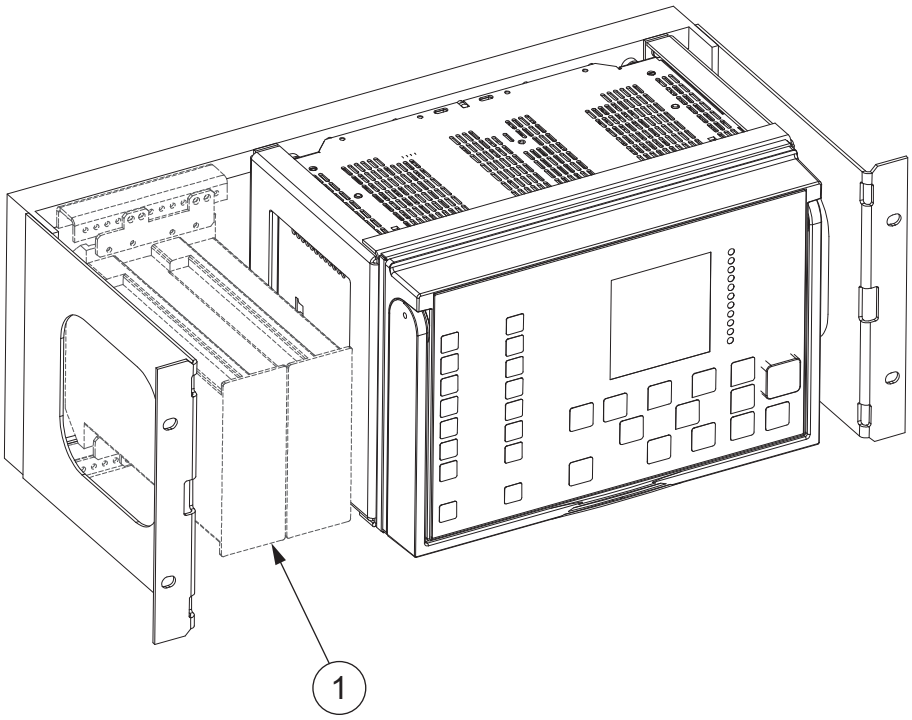
5. Install the plug-in unit into the case.



1 RHGT 19" 4U equipment frame, variant C, with support frame
2 Screw M4x10
3 Washer
4 Mounting bracket

Figure 24: Mounting the protection relay into a 19" combiflex equipment frame

6. Install a RTXP 24 test switch.



1 Test switch RTXP 24

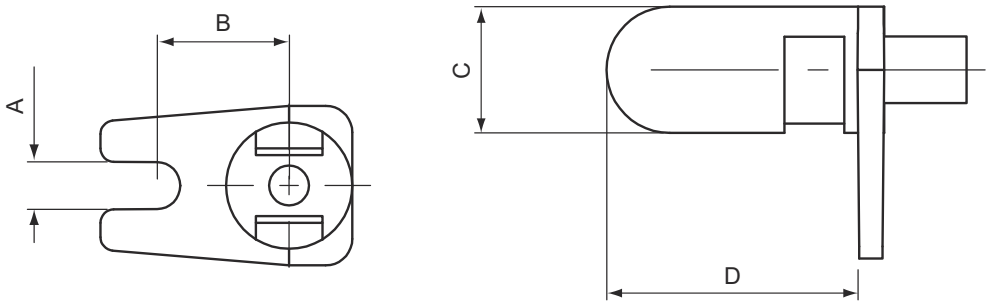
Figure 25: protection relay and the test switch RTXP 24

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 (Ø 10 mm) in the wall of the supervised space.



A 3.5 mm
B 10 mm
C Ø 9.5 mm
D 19 mm

Figure 26: 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.

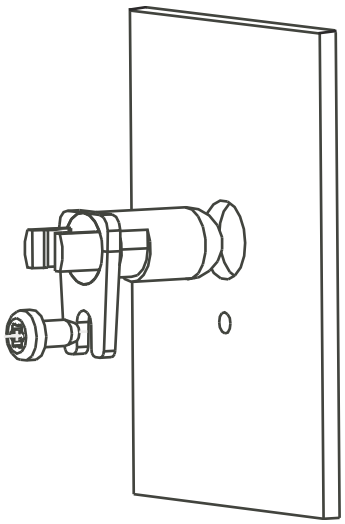


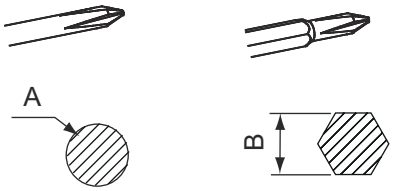
Figure 27: Mounting the lens sensor

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

5 Connecting

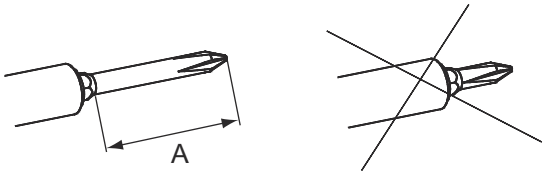
5.1 Required tools

Only use a screwdriver and insert bits for Phillips (PH 2) cross-recessed head screws when handling CT/ VT terminals of screw-compression type.



A Max. ø5.5 mm B Max. ø5 mm

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



A Min. 15 mm

Figure 29: 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 for REF620 and REM620, and both X115 and X120 for RET620. 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 ^{2}. 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.

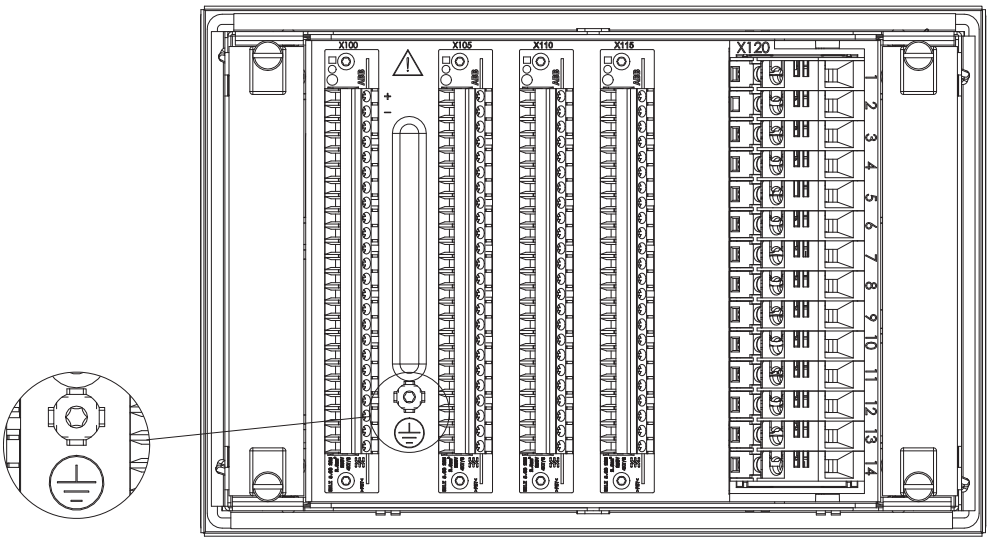


Figure 30: The protective earth screw is located between connectors X100 and X105

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

Each protection relay 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. Remove the fixing screw.
2. Slide the screw through the terminal lug and screw it back on.

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 X115/X120 for CTs/VTs is dimensioned for one 0.5...6.0 mm ^{2} wire or for two wires of maximum 2.5 mm ^{2}.
  - Each terminal X130 for VTs is dimensioned for one 0.5...2.5 mm ^{2} wire.

See the application manual for the terminal diagrams and the combinations of I/Os.

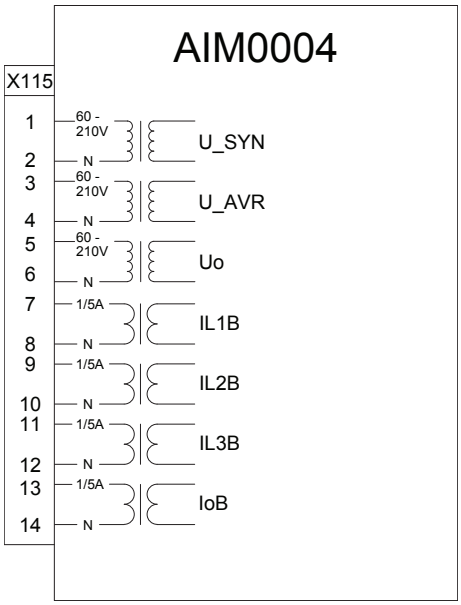


Figure 31: Example of AIM0004 card variant (4 I + 3 U with 1/5 A Io channel)

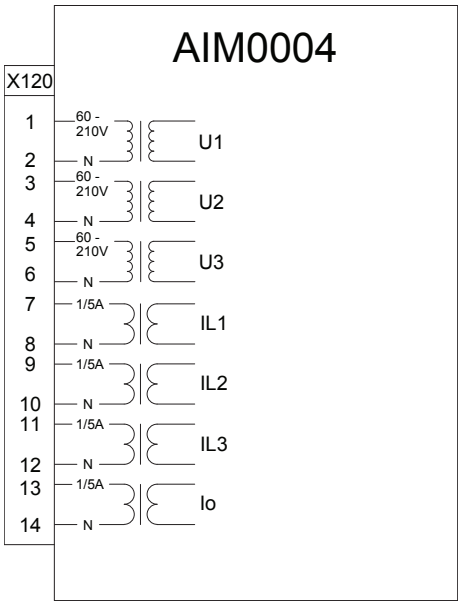


Figure 32: Example of AIM0004 card variant (4 I + 3 U with 1/5 A Io channel)

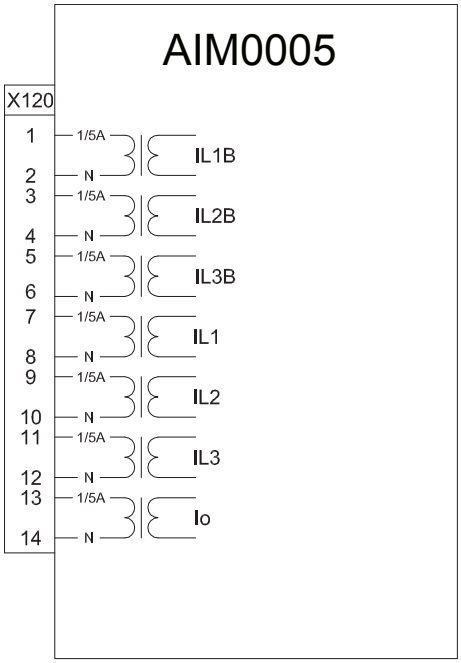


Figure 33: Example of AIM0005 card variant (7 I with 1/5 A Io channel)

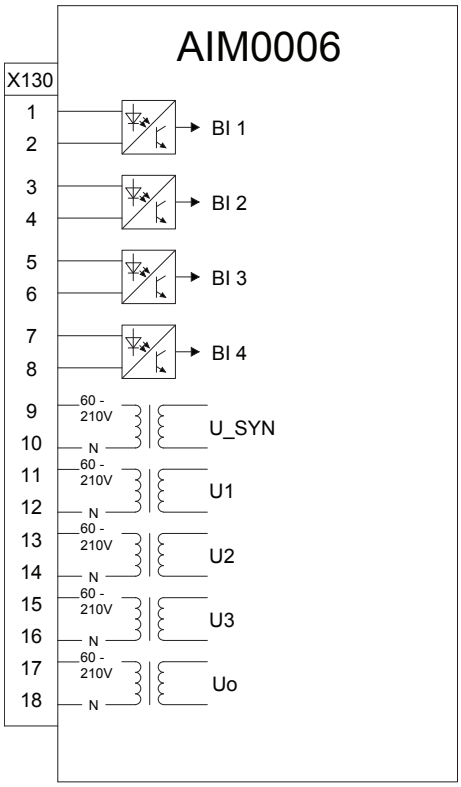


Figure 34: Example of AIM0006 card variant (5 U)

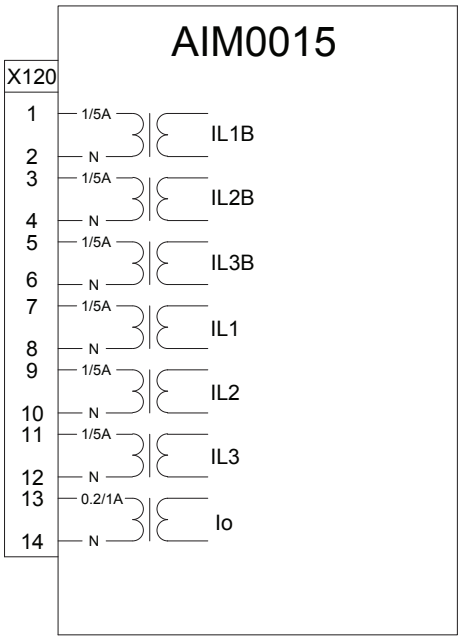


Figure 35: Example of AIM0015 card variant, (7 I with 0.2/1 A Io channel)

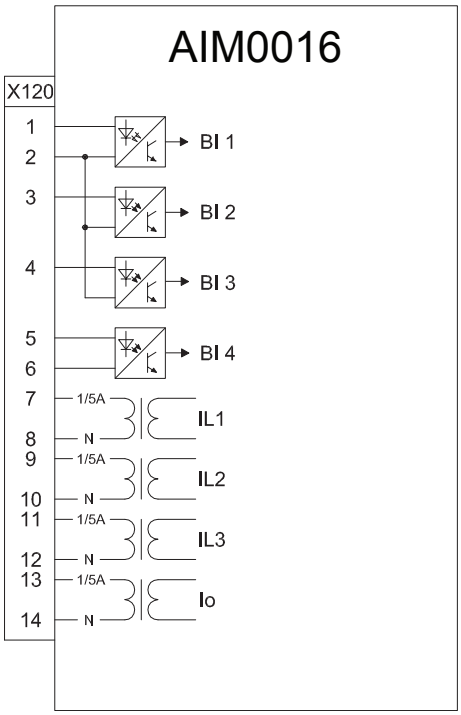


Figure 36: Example of AIM0016 card variant (4 I with 1/5 A Io channel)

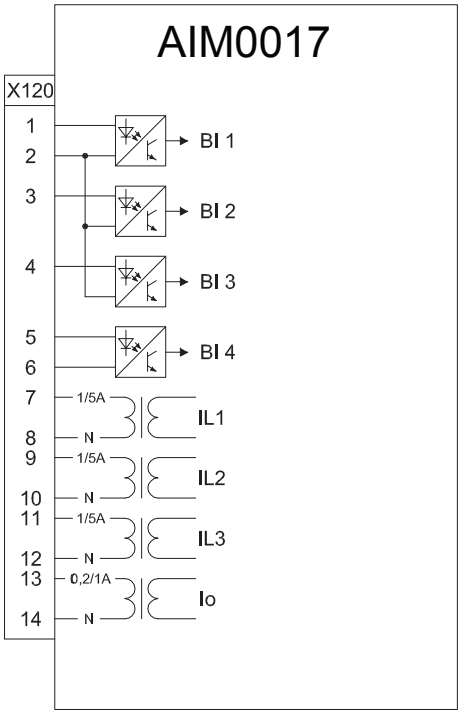


Figure 37: Example of AIM0017 card variant (4 I with 0.2/1 A Io channel)

5.4.2 Connecting current and voltage sensor signaling inputs

- Connect the wires from the sensors to the correct device according to the phase order and the connection diagram.

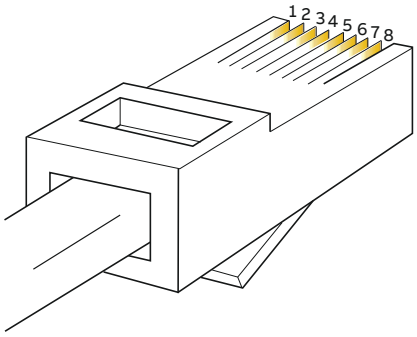


Figure 38: RJ-45 connector `s pin order

The SIM0002 and SIM0005 cards for REF620 and REM620 are provided with one current input terminal for a maximum of 2.5 mm^2 wire and three RJ-45 type connectors which are intended for the current and the voltage sensor signaling inputs.

For more information, see the specific card variants in the application manual.

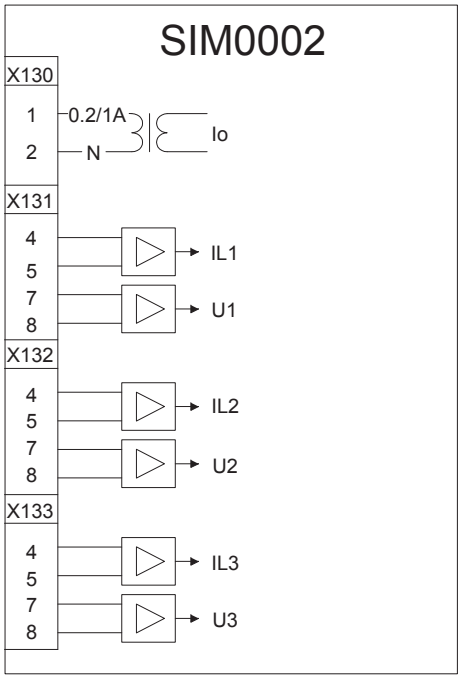


Figure 39: Example of SIM0002 card variant (4I+3U with 0.2/1 A Io channel)

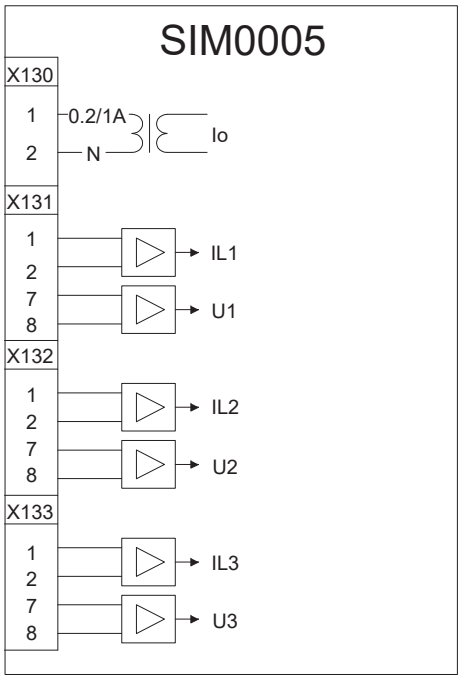


Figure 40: Example of SIM0005 card variant (4I+3U with 0.2/1 A Io channel)

5.4.3 Connecting RTD and mA inputs

- Connect the wires from the transducers to the correct device according to the connection diagram.

  Each terminal for RTDs and mA inputs is dimensioned for one 0.5...2.5 mm ^{2} wire or for two 0.5...1.0 mm ^{2} wires.

See the specific card variant from the application manual.

Connect the RTD earth cable shield to the protective earth.

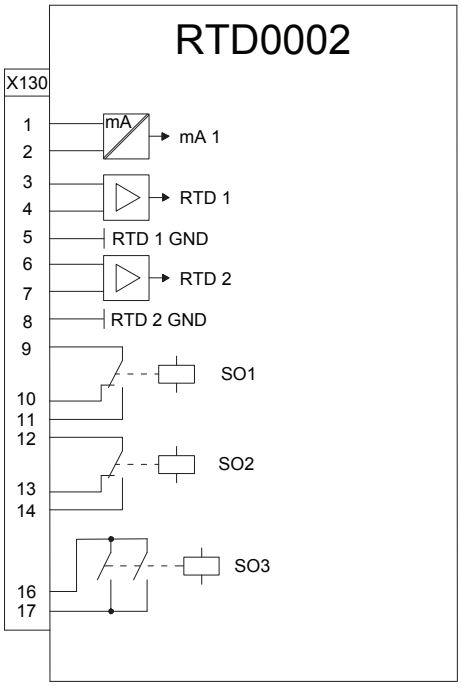


Figure 41: Example of RTD0002 card variant, (2 RTD + 1 mA + 3 SO + TCS)

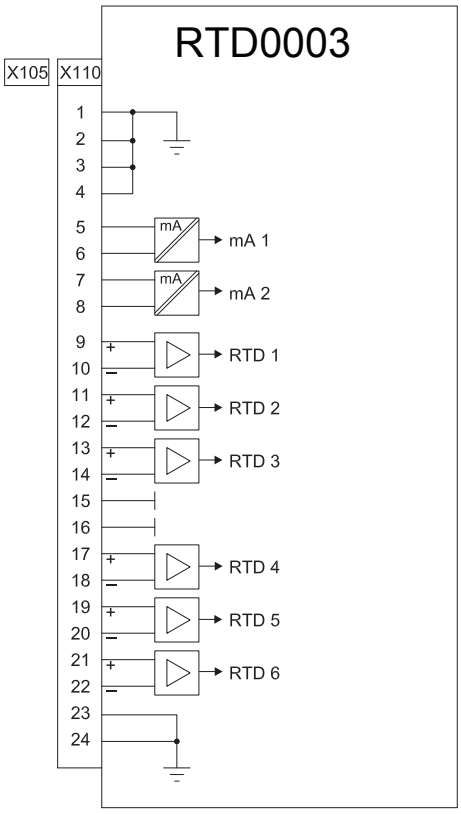


Figure 42: Example of RTD0003 card variant, (6 RTD + 2 mA)

5.4.4 Shielding RTD/mA instrument cables

The RTD/mA inputs are connected by screened cables (1 mm ^{2}/AWG18), for example, Unitronic 300S (formerly Unitronic 300CY), manufactured by LAPP Group.

Other manufacturers' cables with similar technical features can also be used. When selecting a suitable sensor cable, observe also other possible customer installation requirements.

1. Prepare screened cable with a drain wire.
   a) Select a drain wire (0.75 mm ^{2}) as short as possible.

      The wire combination green/yellow should not be used as the drain wire has no protective function.

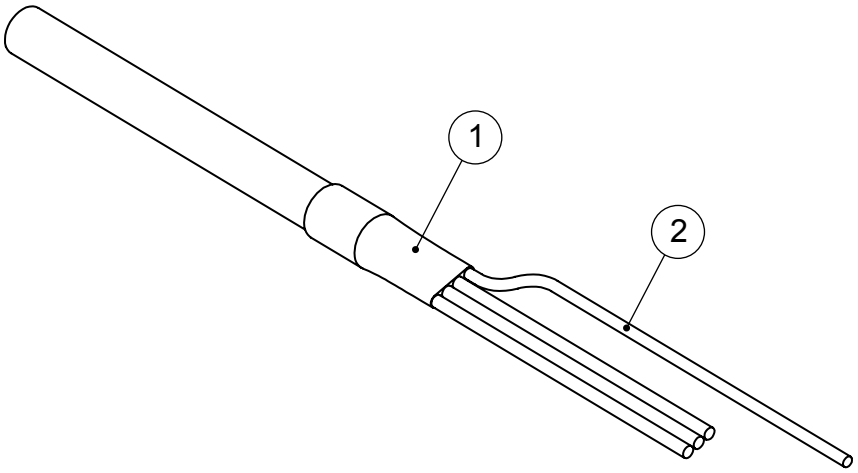
   b) Install the drain wire.

      The wire can be installed, for example, with a Shield-Kon one-piece connector (Thomas & Betts). For detailed instructions, see the manufacturer's manual.

   c) Protect the cable end with a heat shrinkable cap.

Table 3: Drain wire lenghts

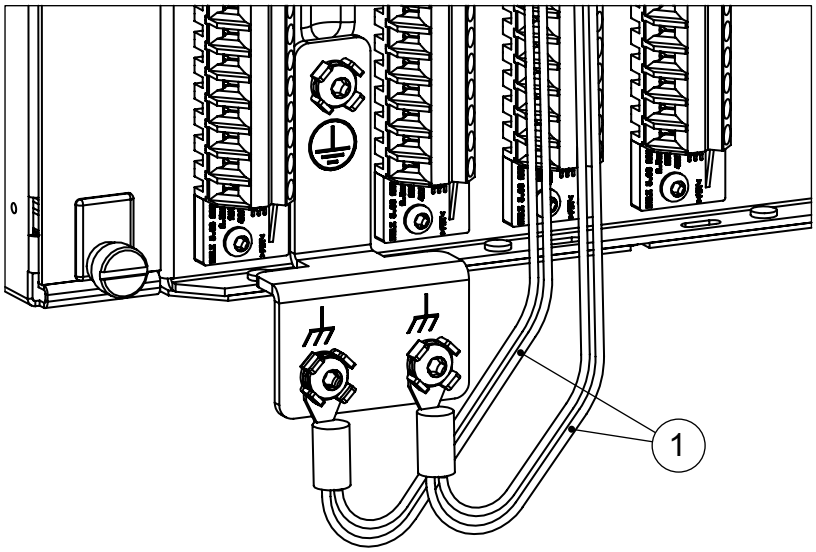
Wire from connector	Length
X110	~200 mm
X115	~200 mm
X130	~300 mm



1 Heat shrinkable cap 2 Drain wire

Figure 43: Screened cable

2. Connect the functional earthing wires (drain wires) to the protection relay's body via a connection flange (2RCA036978A0001) to separate them from the protective earthing conductor.



1 Drain wires

Figure 44: Connection of drain wires

[1] Cannot be used when the protection relay is mounted with the Combiflex 19" equipment frame (2RCA032826A0001)

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 ^{2} wire or for two 0.5...1.0 mm ^{2} wires.

See the specific card variant from the application manual.

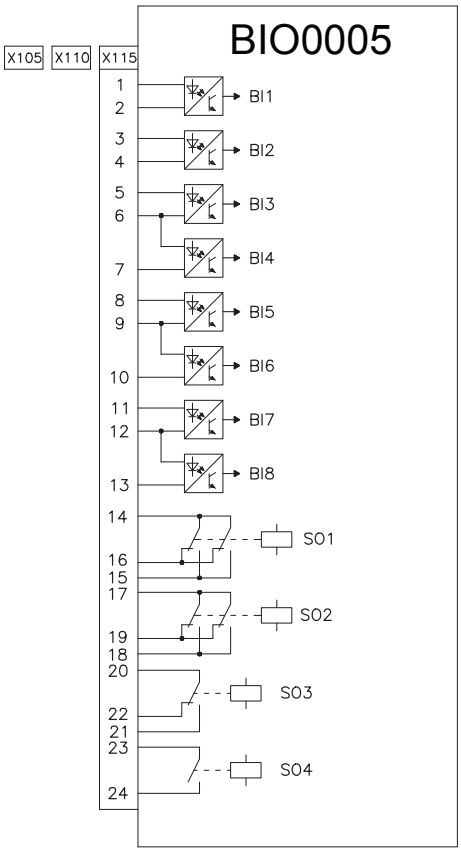


Figure 45: Example of BIO0005 card variant (8 BI + 4 BO)

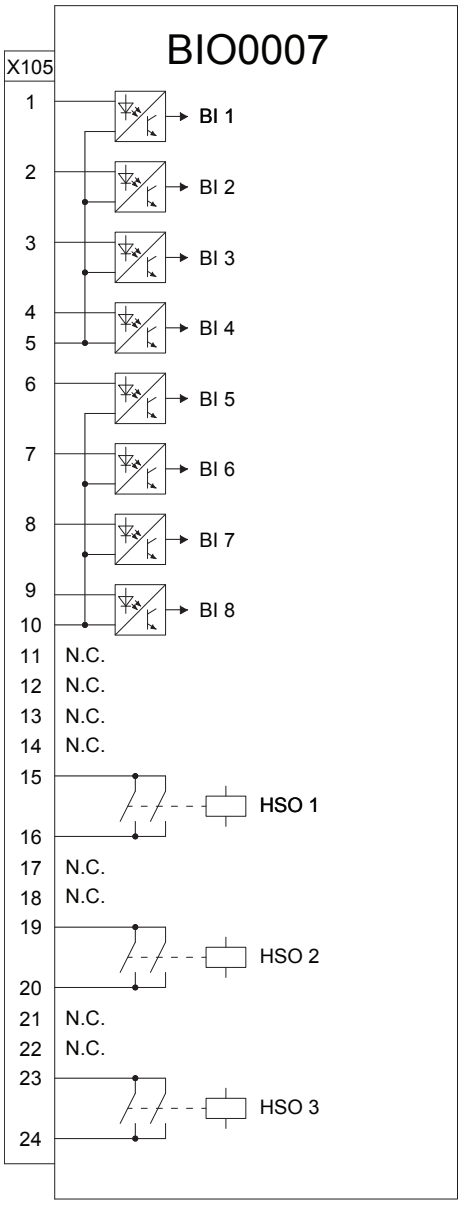


Figure 46: Example of BIO0007 card variant (8 BI + 3 BO)

5.6 Connecting power supply

The permitted auxiliary voltage range of the protection relay is marked on top of the protection relay's LHMI.

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

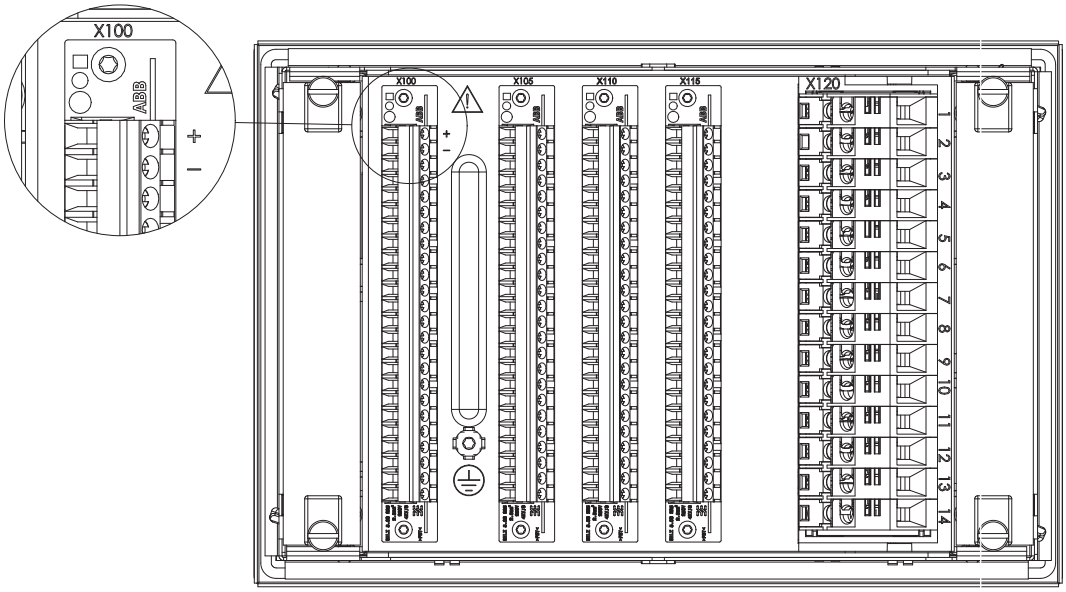


Figure 47: Connecting auxiliary voltage

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 protection relay when viewing the case from the rear.

See the technical manual for product-specific communication interfaces.

5.8 Energizing protection relay

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

- Before connecting the auxiliary power, check that all the wiring is done correctly.
- Remove the protective film from the top side of the unit. Check that there is no debris visible in the ventilation holes.

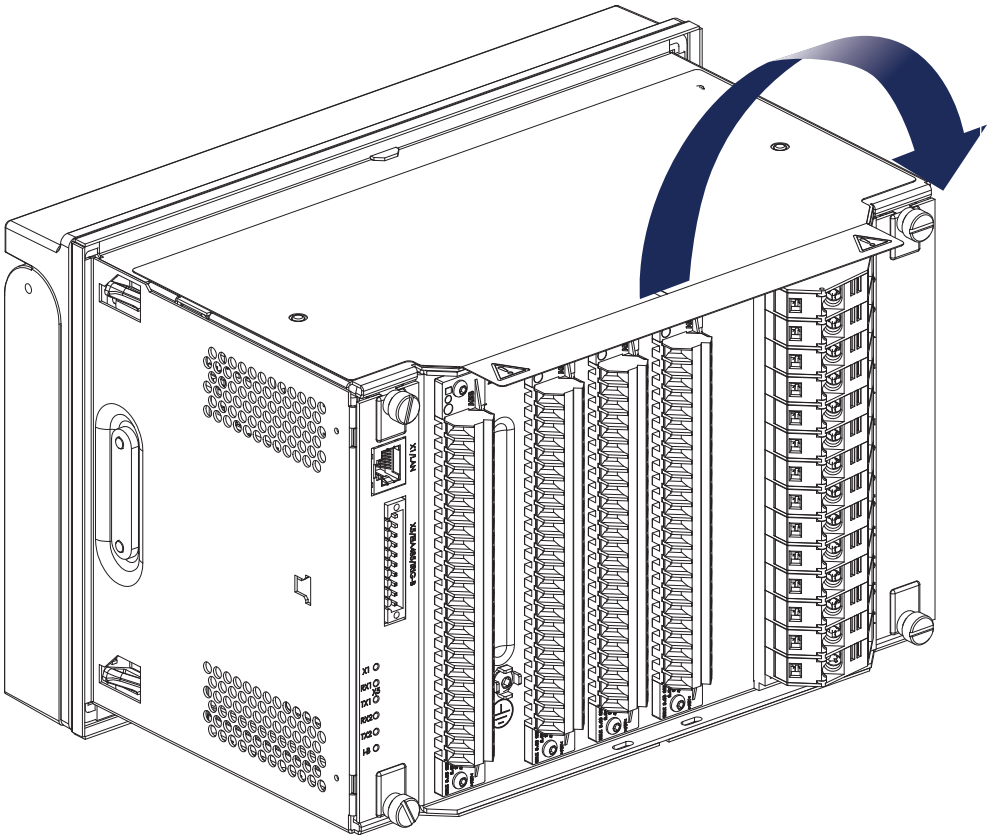


Figure 48: Removing the protective film

During the start-up, indications and self test procedures are shown in a certain order.

1. Green Ready LED starts to flash.
2. LCD lights up and ABB logo is displayed.
3. LCD test patterns are displayed and all the LEDs are lit for a short period.
4. The measurements view is displayed. A steady green Ready LED indicates a successful start-up.

If the protection relay detects a diagnostic error during start-up, the green Ready LED flashes and the internal fault code is displayed on the LCD.

6 Removing, repairing and exchanging

6.1 Product lifecycle

At some point of the product lifecycle, the protection relay 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.

Protection relay specific options can be found from Retrofit Solutions Database on the Internet *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 Checking protection relay information

The protection relay information includes detailed information about the device, such as version and serial number. The protection relay information is shown on the display for a few seconds when the device starts up. The same information is found also in the protection relay menu.

1. Select **Main Menu** > **Information**.
2. Select a submenu with and .
3. Enter the selected submenu with .
4. Browse the information with and .

The **Product identifiers** submenu contains product related information like product type, serial number, order number, production date, configuration name, SW version, SW date and HW revision.

The **Site identifiers** submenu contains information about the site where the protection relay has been installed.

The **System identifiers** submenu contains the Technical key and IEC 61850 version. The Technical key is unique and cannot be changed.

The **HW modules** submenu contains information about the HW modules.

6.3 Removing the protection relay

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.

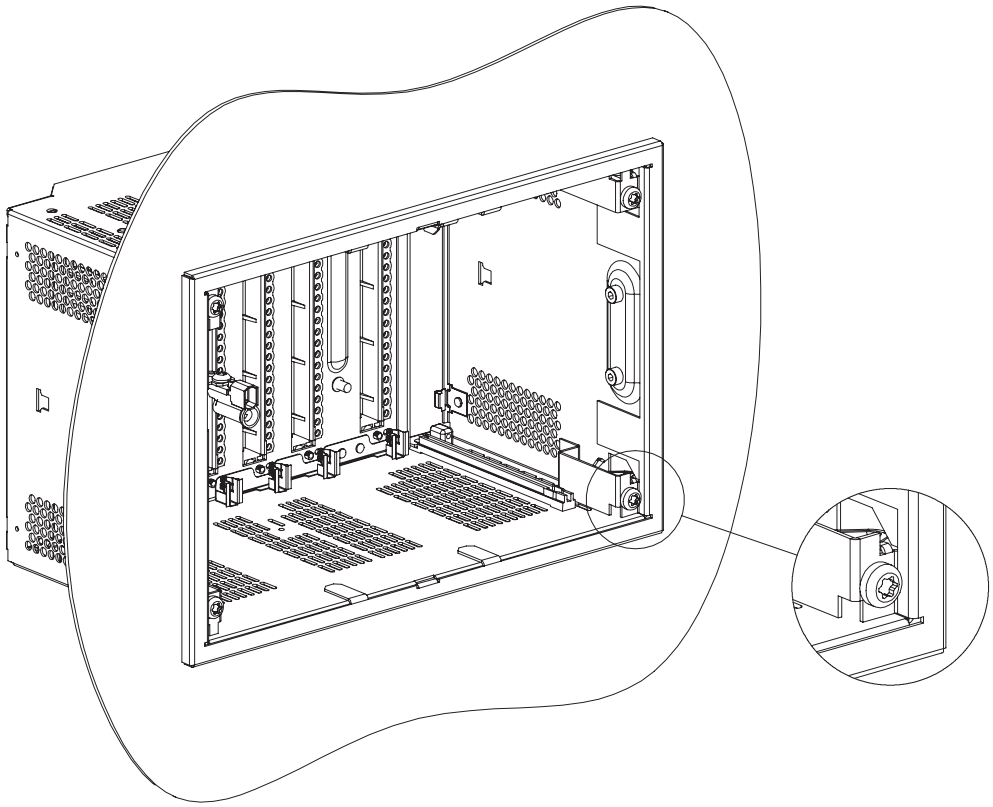


Figure 49: Loosening the M5 screws

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

6.4 Sending protection relay for repair

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

6.5 Exchanging protection relay

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

The exchangeable units can be found from the PartsOnLine system, see *www.abb.com/partsonline*. Use of PartsOnLine requires user registration.

- To exchange a protection relay to a different unit, change the case and connect the wires.

7 Technical data

7.1 Case and HMI display variants

7.1.1 Front side of the protection relay

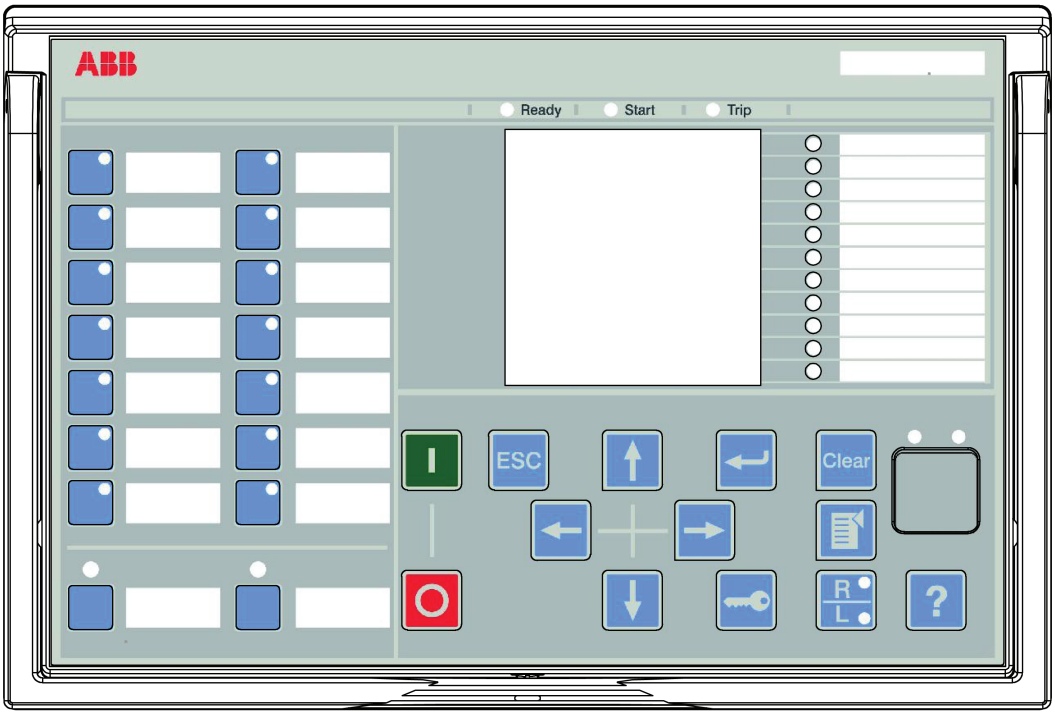


Figure 50: Display

Table 4: Display

Character size[1]	Rows in the view	Characters per row
Small, mono-spaced (6 × 12 pixels)	10	20
Large, variable width (13 × 14 pixels)	7	8 or more

[1] Depending on the selected language

7.1.2 Rear side of the protection relay

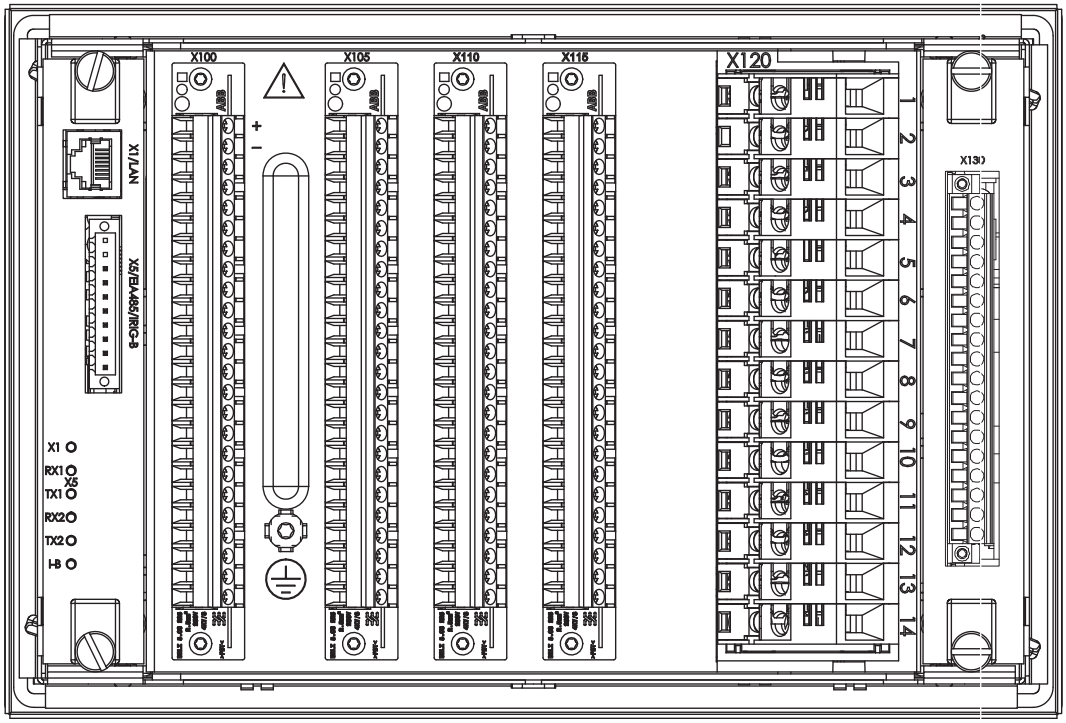


Figure 51: Rear view of REF620 and REM620

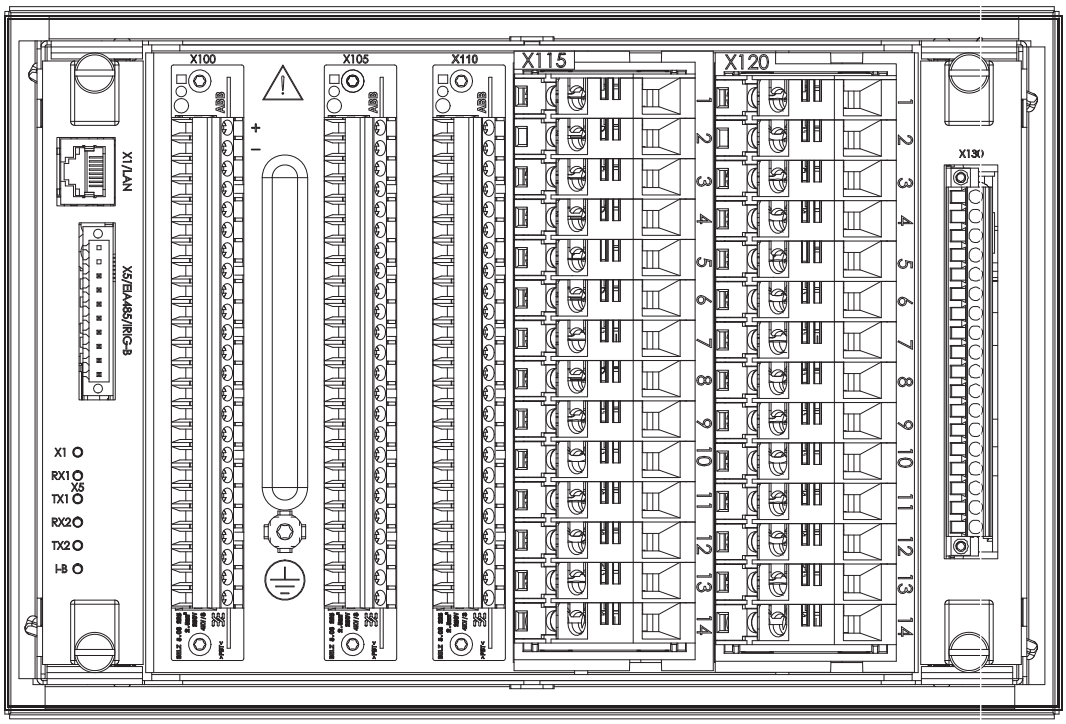
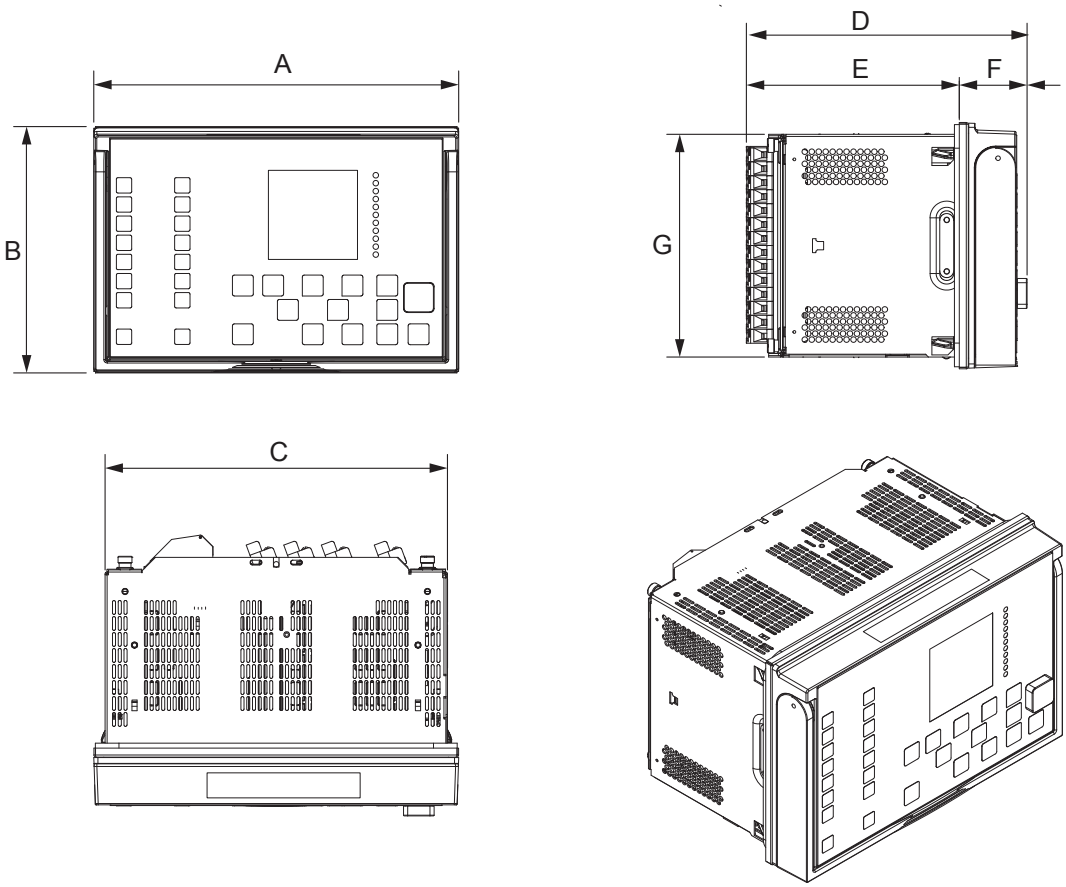


Figure 52: Rear view of RET620

7.2 Dimensions



A	262.2 mm	E	153 mm
B	177 mm, 4U	F	48 mm
C	246 mm	G	160 mm
D	201 mm		

Figure 53: Protection relay's main dimensions

Table 5: Dimensions

Description	Value	
Width	Frame	262.2 mm
	Case	246 mm
Height	Frame	177 mm (4U)
	Case	160 mm
Depth		201 mm
Weight	Complete protection relay	max. 5.5 kg
	Plug-in unit only	max. 3.0 kg

7.3 Degree of protection of flush-mounted protection relay

Table 6: Degree of protection of flush-mounted protection relay

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

8 Accessories and ordering data

Table 7: 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	1MRS120534-3.0
Optical sensor for arc protection, cable length 5.0 m	1MRS120534-5.0

Table 8: Mounting accessories

Item	Order number
Semi-flush mounting kit	2RCA030573A0001
Inclined semi-flush mounting kit	2RCA054775A0001
Wall mounting kit	2RCA030894A0001
19” rack mounting kit with cut-out for one relay	2RCA031135A0001
19” rack mounting kit for one relay and one RTXP24 test switch (the test switch and wire harness are not included in the delivery)	2RCA032818A0001
Mounting bracket for one relay with test switch RTXP in 4U Combiflex (RHGT 19” variant C) (the test switch, wire harness and Combiflex RGHT 19" variant C are not included in the delivery)	2RCA032826A0001
Functional earthing flange for RTD modules[5]	2RCA036978A0001

[5] Cannot be used when the protection relay is mounted with the Combiflex 19" equipment frame (2RCA032826A0001)

9 Glossary

CT	Current transformer
EMC	Electromagnetic compatibility
HW	Hardware
LCD	Liquid crystal display
LCP	Liquid crystal polymer
LED	Light-emitting diode
LHMI	Local human-machine interface
PA	Polyamide
PBT	Polybutylene terephthalate
PC	1. Personal computer 2. Polycarbonate
RoHS	Restriction of hazardous substances
RTD	Resistance temperature detector
SW	Software
VT	Voltage transformer

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