

Disclaimer of Liability

Although we have carefully checked the contents of this publication for conformity with the hardware and software described, we cannot guarantee complete conformity since errors cannot be excluded.

The information provided in this document is checked at regular intervals and any corrections that might become necessary are included in the next releases. Any suggestions for improvement are welcome.

Subject to change without prior notice.

Copyright

Copyright © Siemens AG 2017 – All Rights Reserved

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

Registered Trademarks

SIPROTEC®, DIGSI®, SIGUARD®, SIMEAS® and SICAM® are registered trademarks of SIEMENS AG. All other product and brand names in this manual might be trademarks, the use of which by third persons for their purposes might infringe the rights of their respective owners.



NOTE

Assembly Dimensions, Installation, Terminal and Connection Diagrams and Technical Data are part of the SIPROTEC 5 Hardware Manual.

The manuals are available in the SIPROTEC Download Area on the Internet (http://www.siemens.com/siprotec).

Notes on Safety

This manual contains notes that must be adhered to for your own personal safety and to avoid damage to property.

However, it does not constitute a complete description of all safety measures required for installation, service, and maintenance of the equipment (module, device) in question. Details are to be taken from the manuals and those are mandatory.



WARNING

Danger of severe personal injury or substantial damage to property

Hazardous voltages may occur in devices and modules during operation depending on the design and application.

- Always observe the instructions given in "Qualified Electrical Engineering Personnel" below.

Qualified Electrical Engineering Personnel

Only qualified electrical engineering personnel may commission and operate the equipment (module, device) described in this document. Qualified electrical engineering personnel in the sense of this document are people who can demonstrate technical qualifications as electrical technicians. These persons may commission, isolate, ground and label devices, systems and circuits according to the standards of safety engineering.

Use as Prescribed

The equipment (device, module) may only be used for such applications as set out in the catalogs and the technical description, and only in combination with third-party equipment recommended and approved by Siemens.

Problem-free and safe operation of the product depends on the following:

- Proper transport
Proper storage, setup, and installation
Proper operation and maintenance



WARNING

Danger of death, personal injury or substantial property damage

Non-observance of the following measures can result in death, personal injury or substantial property damage.

- The equipment must be grounded at the grounding terminal before any connections are made. This is also valid for the connections between base and expansion modules. The conductor cross-section must be at least AWG 10 (4 mm²). The tightening torque for the M4 grounding screw must be at least 1.2 Nm.
All circuit components connected to the power supply may be subject to hazardous voltages.
Hazardous voltages may be present in equipment even after the supply voltage has been disconnected (capacitors can still be charged).
The power-supply unit has an internal fuse which cannot be changed.
Equipment with exposed current-transformer circuits must not be operated. Before disconnecting the equipment, ensure that the current-transformer circuits are short-circuited.
The limit values stated under "Technical Data" in the SIPROTEC 5 Hardware manual may not be exceeded. This must also be considered during testing and commissioning.

If you require further information, or if particular problems occur that are not handled in sufficient depth in the instructions of the respective product, you can request help through your local Siemens Office or representative.



WARNING

Laser radiation! Danger of eye injury

This device may contain a class 1 laser.

- Do not look directly into the beam.



CAUTION

Danger of damage due to static electrical charges

The printed circuit boards of numerical relays contain CMOS circuits. These shall not be withdrawn or inserted under live conditions! The modules must be so handled that any possibility of damage due to static electrical charges is excluded.

- During any necessary handling of individual modules the recommendations relating to the handling of electrostatically endangered components (EEC) must be observed.
In installed conditions, the modules are in no danger.

Statement of Conformity

CE mark and text: Low-voltage Directive 2014/35/EU, EMC Directive 2014/30/EU, This conformity is based on the compliance with the following harmonized standards: EN 60255-26 and EN 60255-27

Other Standards

IEEE Std C 37.90
The technical data of the product is approved in accordance with UL.
For more information about the UL database, see www.ul.com
Select Online Certifications Directory and enter E194016 as UL File Number.



NOTE

Battery disposal

The batteries must only be replaced with the same type or another type recommended by the manufacturer. Improper replacement involves explosion hazard. For disposing the batteries it is necessary to observe the local national/international directives.

Conditions of UL Listing

Servicing of the circuitry involving the batteries and replacement of the lithium batteries shall be done by a trained technician.

Replace battery with VARTA or Panasonic CR 2032 or BR 2032 type batteries only. Use of another Battery may present a risk of fire or explosion. See Hardware manual for safety instructions.

Field wires of control circuits shall be separated from other circuits with respect to the end use requirements.

Type 1 if mounted into a door or front cover of an enclosure. When expanding the device with the 2nd device row, then they must be mounted completely inside an enclosure.

Temporarily permissible surrounding air temperature tsurr: max. 70 °C (158 °F), Load conditions for the non-modular devices: With surrounding air temperatures above 55 °C, no more than 50 % of the binary inputs and relay outputs per assembly are allowed to be continuously active.

Binary input voltage DC: Urated 250 V max.

Max. rated data of the output contacts in accordance with UL certification:

Table with 2 columns: Relay Type and Specifications. Includes Standard Relay (Type S), Fast Relay (Type F), High-Speed Relay with Semi-conductor Acceleration (Type HS), and Power Relay (for Direct Control of Motor Switches).



CAUTION

Danger of fire or chemical burn hazard

The battery used in this device may present a fire or chemical burn hazard if mistreated.

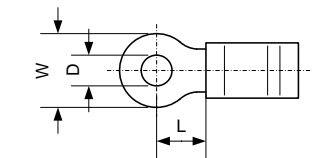
- Do not recharge, disassemble, heat above 100 °C (212 °F) or incinerate.
Dispose the used battery promptly.
Keep away from children!

Current Terminals

Wire cross-section

2x AWG 14-10 (2.0 mm² to 4.0 mm²) solid or
2x AWG 12-10 (2.6 mm² to 5.2 mm²) stranded with UL-listed Ring Cable Lug, for example, PIDG by Tyco
Use copper conductors only, at least certified for a temperature of +105 °C
Use prepared solid conductors intended for single or multi-wiring connection, maximum 2 wires per pole, and for usage of ferrules, crimped-on pressure wire connectors (ring-type and pin-type).

Ring Cable Lug with plastic sleeve
Stripping length (when used without Ring Cable Lug)



Permissible tightening torque at the terminal screw

Location on device

L = 10 mm (0.39 in) to L = 12 mm (0.47 in)
15 mm (0.59 in); only solid copper wires may be used.

D (for bolt): 5.0 mm (0.20 in)
W: 9.5 mm (0.37 in)
L: 7.1 mm (0.28 in) to 7.7 mm (0.30 in)

2.7 Nm (23.9 lb.in.)

To be visible as follows:



Voltage Terminals, Binary Inputs and Outputs

Wire cross-section

1x AWG 20-14 (0.5 mm² to 2.5 mm²) solid or stranded with UL-listed ferrule
Use copper conductors only, at least certified for a temperature of +105 °C

Ferrule with plastic sleeve

Stripping length (when used without ferrule)

Permissible tightening torque at the terminal screw

Location on device

L = 12 mm (0.47 in)
12 mm (0.47 in); only copper wires may be used.

1.0 Nm (8.85 lb.in.)

To be visible as follows:



**Voltage Terminals**

Wire cross-section	AWG 22-12 (0.5 mm <sup>2</sup> to 2.5 mm <sup>2</sup> ) solid or stranded with listed ferrule, at least certified for a temperature of +105 °C
Conductor sleeve with plastic sleeve	L = 10 mm (0.39 in)
Stripping length (when used without conductor sleeve)	10 mm (0.39 in); only copper wires may be used.
Permissible tightening torque at the terminal screw	0.6 Nm (5.31 lb.in.)
Location on device	To be visible as follows:

**Voltage Terminals IO111**

Wire cross-section	AWG 30-16 (0.14 mm <sup>2</sup> to 1.5 mm <sup>2</sup> ) solid or stranded with listed ferrule, at least certified for a temperature of +105 °C
Conductor sleeve with plastic sleeve	L = 9 mm (0.35 in)
Stripping length (when used without conductor sleeve)	9 mm (0.35 in); only copper wires may be used.
Permissible tightening torque at the terminal screw	0.22 Nm to 0.26 Nm (1.95 lb.in. to 2.30 lb.in)
Location on device	To be visible as follows:

**Unpacking a Device**

Devices are tested prior to delivery. Devices are packed on site in a way that meets the requirements of standard ISO 2248.

- Check the packing for external transport damage. Damaged packing may indicate that the devices inside have also sustained damage.
- Unpack devices carefully; do not use force.
- Visually check the devices to ensure that they are in perfect mechanical condition.
- Check the enclosed accessories against the delivery note to make sure that everything is complete.
- Keep the packing in case the devices must be stored or transported elsewhere.
- The device must be situated in the operating area for at least 2 hours before you connect it to the power supply for the first time or after the device has been in storage. Thus, you ensure temperature equalization and avoid humidity influences and condensation.

**Routine-Test Report**

You can download the routine-test report on the following Internet site using the device serial number:

<https://www.ea-testreports.siemens.com/>

**Repacking a Device**

- If you store devices after incoming inspection, pack them in suitable storage packaging.
- If devices are to be transported, pack them in transport packing.
- Put the accessories supplied in the packing with the device.

**Returning a Device**

- Return devices to the manufacturer, stating the defect. Use the original packaging or transport packaging that meets the requirements of standard ISO 2248. Return damaged devices to the following address:  
  
Siemens AG  
EM DG PRO MF Rückwaren  
Rohrdamm 7  
13629 Berlin  
Germany
- When returning the devices, make sure that they are sent with the original current and voltage terminals or alternatively – if the wired terminals must remain in the plant – with the locks intended for the transport. Concerning the green single-row voltage terminals, it is not important whether they are plugged in or not. An alternative transport lock is not necessary for these terminals.
- Protect the optical interfaces on the communication or arc-protection modules against pollution due to dust. For this, use, for example, the dust caps mounted on the device in delivery state.

For further information, refer to the Hardware Manual.

**Storing a Device**

- Only store devices on which you have carried out an incoming inspection, thus ensuring that the warranty remains valid. The incoming inspection is described in the Operating manual.
- SIPROTEC devices must be stored in rooms, which are clean and dry. Devices or associated replacement modules must be stored at a temperature of -25 °C to +55 °C (-13 °F to 131 °F).
- The relative humidity must be at a level where condensate and ice is prevented from forming.
- Siemens recommends that you observe a restricted storage temperature range of +10 °C to +35 °C (50 °F to 95 °F), in order to prevent the electrolytic capacitors used in the power supply from aging prematurely.
- If the device has been in storage for more than 2 years, connect it to an auxiliary voltage for 1 to 2 days. This will cause the electrolytic capacitors to form on the printed circuit board assemblies again.
- If devices are to be shipped elsewhere, you can reuse their transport packaging. If using other packaging, ensure that the transport requirements according to ISO 2248 are met. Storage packaging for individual devices is not adequate for transport purposes.
- The lithium batteries contained in SIPROTEC devices meet all international requirements of the hazardous goods specifications for the various carriers (Special Provision 188 of the UN Recommendations on the Transport of

Dangerous Goods, Special Provision A45 of the IATA Dangerous Goods Regulations, and the ICAO Technical Instructions). This only applies to the original battery or genuine replacement batteries.

**Rated Values**

The rated values shown on the name plate of the device have to be observed.

**Operating Temperature**

Permissible temperature range for permanent operation:  
-10 °C to +55 °C (+14 °F to +131 °F)

**Other Environmental Conditions**

Maximum altitude above sea level: 2000 m (6562 ft)  
Minimum admissible atmospheric pressure: 783.8 hPa  
Degree of pollution: 2

**Degree of Protection (acc. to IEC 60529)**

For use in environment with degree of pollution 2.

Panel surface mounting	Front IP54
Panel flush mounting	Front IP54
Protection against contact	IP2x for current terminal (installed) IP2x for voltage terminal (installed)

**Open Source Software**

The product contains, among other things, Open Source Software developed by third parties. The Open Source Software used in the product and the license agreements concerning this software can be found in the Readme\_OSS. These Open Source Software files are protected by copyright. Your compliance with those license conditions will entitle you to use the Open Source Software as foreseen in the relevant license. In the event of conflicts between Siemens license conditions and the Open Source Software license conditions, the Open Source Software conditions shall prevail with respect to the Open Source Software portions of the software. The Open Source Software is licensed royalty-free. Insofar as the applicable Open Source Software License Conditions provide for it you can order the source code of the Open Source Software from your Siemens sales contact - against payment of the shipping and handling charges - for a period of at least 3 years since purchase of the Product. We are liable for the Product including the Open Source Software contained in it pursuant to the license conditions applicable to the Product. Any liability for the Open Source Software beyond the program flow intended for the Product is explicitly excluded. Furthermore any liability for defects resulting from modifications to the Open Source Software by you or third parties is excluded. We do not provide any technical support for the Product if it has been modified.

When using DIGSI 5 in online mode, you are provided with the option to go to the main menu **Show Open source information** and read and display the Readme\_OSS file containing the original license text and copyright information.

To do this, the following steps are necessary:

- Switch to online mode.
- Select the device.
- Select **online** in the menu bar.
- Click **Show Open source information**.

**NOTE**

To read the Readme\_OSS file, a PDF viewer must be installed on the computer.

In order to operate SIPROTEC 5 devices, a valid DIGSI 5 license is required.