



Features

Mounting kits

- Mounting kits for space-saving mounting in racks and cubicles and on walls
- IP54 protected mounting capability in cubicles

Cases

- RHGS6, RHGS12 and RHGS30 cases realizes mounting of for example Combiflex modules

Test switch module

- Fail-safe testing of terminals, using test switch RXP 24
- Time saving while
 - all connections for test are made from the front
 - easy to move between terminals of the same type

Key switch for settings

- Possibility to lock settings with key switch

Combiflex modules

- Provide functionality such as lock-out, lock-out reset and external contact reinforcement
- Supervision

Connectors

- Flexible connection of signals and voltages
 - Screw compression type or spring compression type

External resistor unit

- Part of the High impedance differential protection

Summation CT

- Used for cost effective summation type differential principle

Interface converter

- External interface converter from C37.94 to G.703

GPS antenna

- Used with the GPS time synchronization module

Configuration and monitoring tools

- Software tools to
 - configure the terminal
 - set parameters
 - monitor the terminal and the system
 - visualize and evaluate disturbance recordings
- Supervision and control via high voltage IEDs (HV/Control package)
- Provides on request information from IEDs
- Collection of disturbances from high voltage IEDs
- Consists of standard library functions for easy application engineering of a station HMI

Mounting kits

19" rack mounting

Use the 19" rack mounting kit to mount the IED in a standard rack. Combine the rack mounting kit with the side-by-side mounting kit to mount IEDs or an IED and test a switch module in the same rack position.

The 19" rack mounting kit is available in four designs, suitable for 1/4, 1/2, 3/4 or full width cases and consists of two rack flanges (1a) and (1b) with appropriate mounting details (2) for fastening to the case.

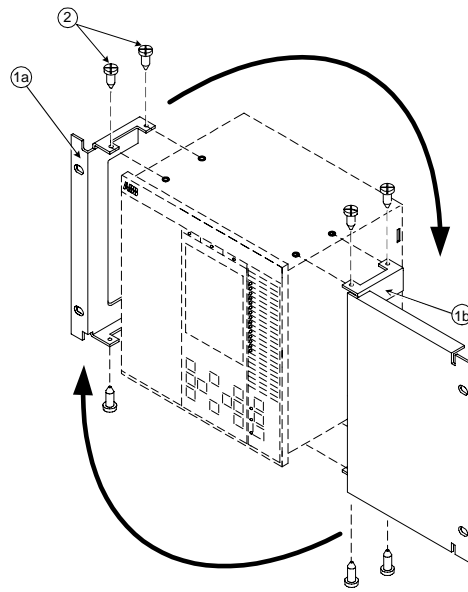


Figure 1: The rack mounting kit

Flush mounting

Use the flush mount kit for installation in a panel cut out.

The flush mounting kit consists of four fasteners (2) with appropriate mounting details (4) and a sealing strip (5) for fastening to the IED (3).

To receive IP54 class protection, an additional sealing (1) must be ordered with the IED. This sealing is factory mounted.

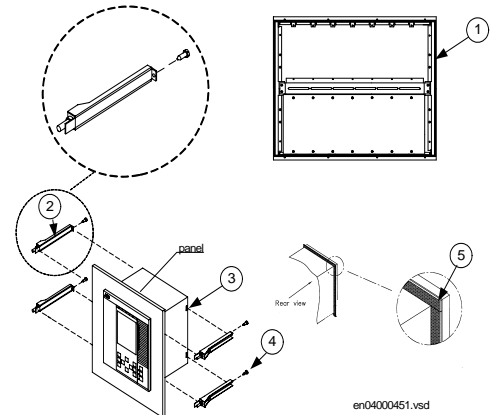


Figure 2: The flush mounting kit

Wall mounting

Use the wall mounting kit to projection mount the IED on a wall.

The wall mounting kit consists of a mounting bar pair (4) and a IED bracket pair (6). Screws (2) and (5) and washers (1) for fastening of the terminal are included, but not wall fasteners (3).

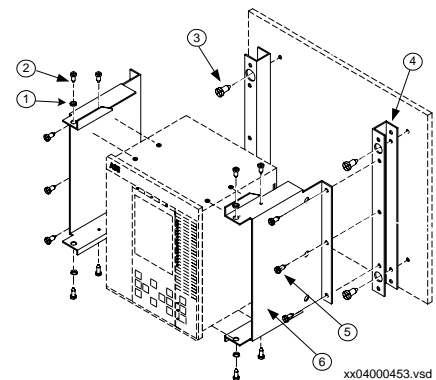


Figure 3: The wall mounting kit

Side-by-side mounting

Use the side-by-side mounting kit to mount two IEDs or a IED and its corresponding test switch module next to each other.

The side-by-side mounting kit consists of two mounting plates (1) and eight screws (2). The side-by-side mounted units are mounted in a rack or cubicle using the appropriate kit, in this example the rack mounting kit (4).

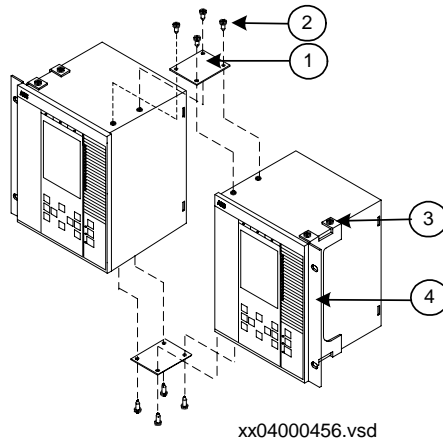


Figure 4: The side-by-side mounting kit

Protection cover for rear area

The protection cover for the rear area is a steel cover with a slot for cable entrance at the bottom part.

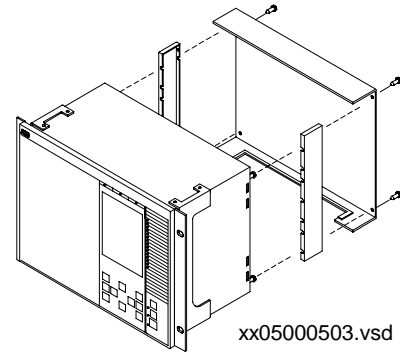


Figure 5: Protection cover for rear area

Cases

Color matched (RAL7035) RHGS cases can be used to mount for example Combiflex modules together with IED 670. See [section "Related documents"](#) for reference to more detailed information about dimensions. Please observe that cases in referenced document has a different color.

Test switch module

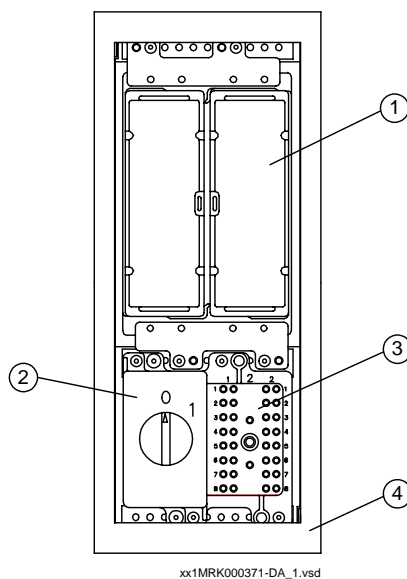
General

The test switch module consists of a RHGS6 case with a test switch, RTXP 24, and a two-seat Combiflex terminal base mounted. An optional DC-switch occupies one seat if selected. A side-by-side mounting kit is included.

All connections to the test switch module are made with Combiflex socket leads. Test contacts 1-24 of

the test switch have 20 A Combiflex terminals. The signal contact of the test switch and the Combiflex terminal base have 10 A terminals.

For more details about the Combitest system and Combiflex system see [section "Related documents"](#).



- 1 Test switch
- 2 DC switch
- 3 Spare seat, can be used for Key switch
- 4 RHGS6 case

Figure 6: Example of a test switch module

Test switch

The test switch, RTXP 24, is used to make it possible to test a IED in a failsafe way. Inserting a test-plug handle into the test switch automatically makes all preparations for test in the proper sequence. Blocked trip circuits, shortcircuited CT's, opened voltage circuits makes the IED terminals available for secondary injection test.

DC-switch

The DC-switch is optional in the test switch module and are used to switch the DC-supply of the IED ON/OFF.

The DC-switch is of one seat Combiflex type and needs a Combiflex terminal base to be mounted.

Key switch for settings

The key switch for lock-out of settings via LCD-HMI is used to prevent unwanted changes of settings. The switch locks the settings via a binary input.

The key switch is of one seat Combiflex type. To install it, a case including a Combiflex terminal base is needed. One possibility is to install the key switch in the same case as the test switch.

Combiflex modules

Auxiliary relays

Auxiliary relays can be used together with IED 670 to provide functionality such as lock-out, lock-out reset or external contact re-enforcement

When the capacity of the contact of the IED 670 is not sufficient, it is recommended to use RXME1 as

a contact re-enforcement. The RXME1 is then activated from a IED 670 contact which is set up to be activated together with the IED 670 contacts tripping the breaker. The contact of the RXME1 is connected in parallel, to take over the breaker trip coil current. This gives an efficient solution and means no time delay at tripping. See [figure 7](#).

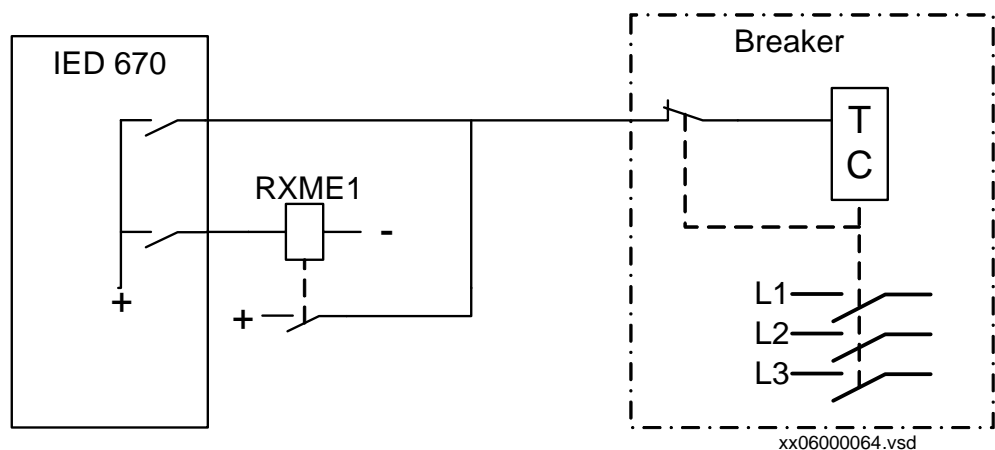


Figure 7: RXME1 used as a trip contact re-enforcement

When single pole tripping is used one RXME1 is required per phase and of course per subsystem in redundant systems.

Lock-out can be arranged with RXMD1 remanence relay activated from binary outputs on IED 670 and possible other protection relays required to activate lock-out, see [figure 8](#). The contact of RXMD1 is connected to open the closing circuit to the breaker closing coil. Another contact can be

used to light-up a lamp push button to have indication of the lock-out and then reset with the push-button. It is recommended to avoid trip contact latching as this will mean problem e.g. with trip circuit supervision and further at failing breaker, mean that the trip coil is burnt and the trip coil DC supply is tripped. The most important is to prevent that the breaker is closed at persistent faults.

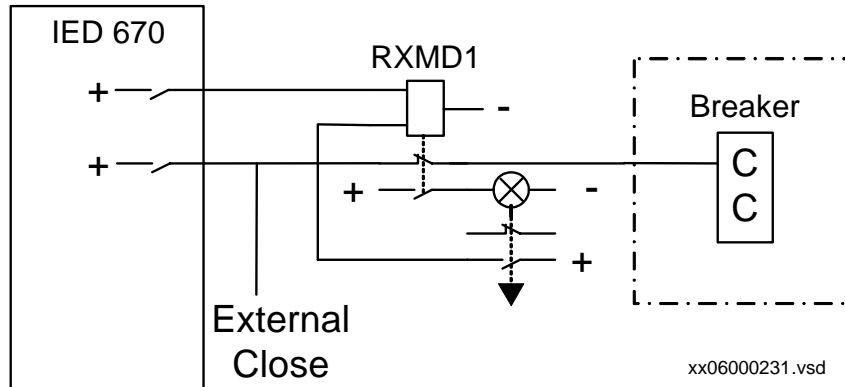


Figure 8: Lock-out using a RXMD1 relay

For ordering codes see [section "Related documents"](#) for reference to more detailed information.

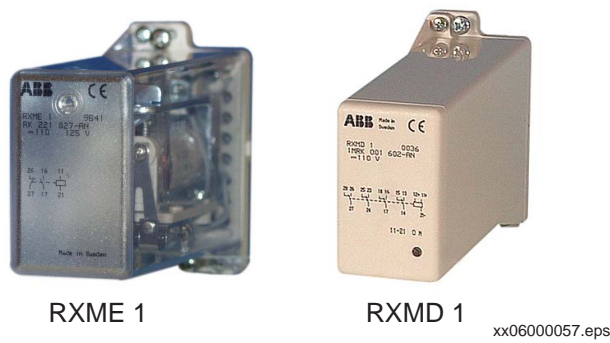


Figure 9: RMXE1 and RXMD1 relays

Push button and selector switch

The push button is available with or without pilot lamp and with one or two buttons. It is used to reset the lock-out relays when an external independent lock-out and lock-out indications is required. The push button unit can also be used as a local selector of Auto-Reclose operation when this is

required to be done locally as well as through communication.

The selector switch is available with two or three fixed positions and with different contact combinations. Selector switch can e.g. be used as Local/Remote selector or as a local selector of Auto-Reclose operation. See [section "Related documents"](#) for reference to more detailed information.

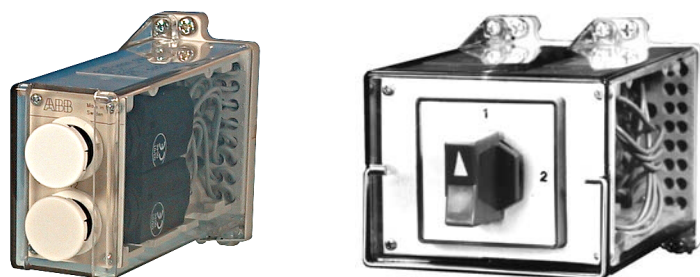


Figure 10: Push button and selector switch

Supervision relay

The relay RXEM1 can be used to detect for example loss of DC voltage supply or to detect open circuits. A typical application is continuous

supervision of a circuit breaker trip circuit, including the breaker coil. See [section "Related documents"](#) for reference to more detailed information.



xx06000060.eps

Figure 11: Supervision relay RXEM1

Connectors

The connectors are used for voltage signals and binary in- and output signals.

A special crimping tool from Phoenix is needed to apply the Phoenix ferrule to the wires.

Use the ferrules to connect two wires to the same terminal point of a connector. Note that 1.5 mm² is the maximum dimension allowed on these wires.

Use the bridge connector to jumper terminal points in a connector.

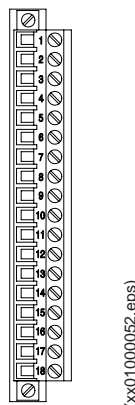


Figure 12: Voltage connector

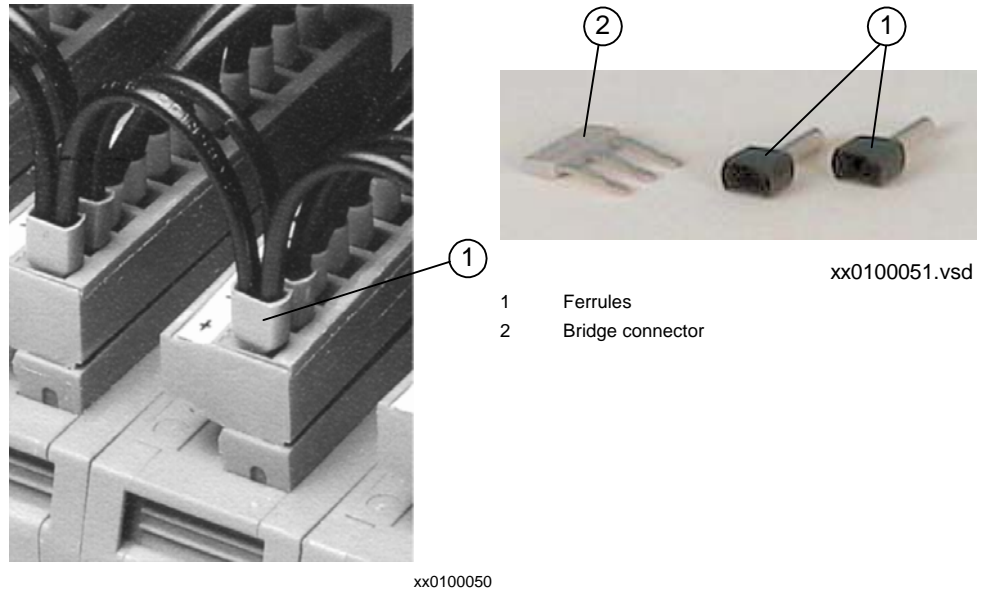


Figure 13: Connected cables with ferrules

External resistor unit

The high impedance resistor unit is used with the high impedance differential protection. It is available as one phase unit or three phase unit.

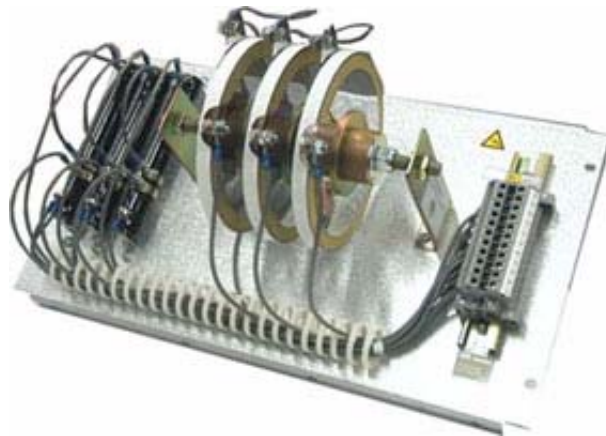
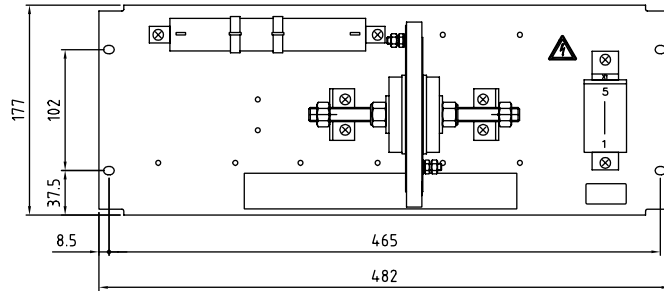


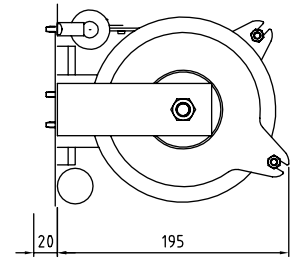
Figure 14: High impedance resistor unit, three phase



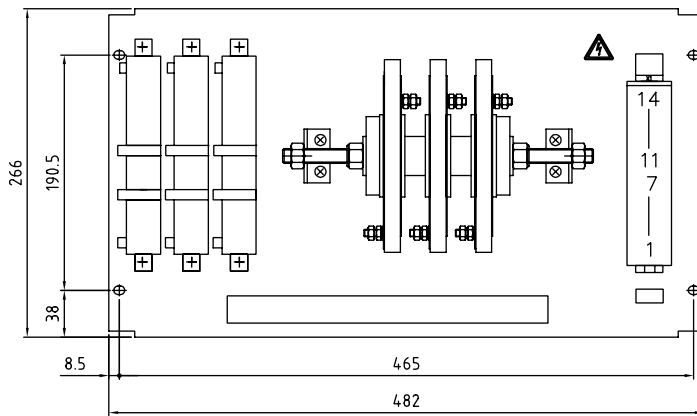
Dimension
(mm)



Figure 15: Dimension drawing of a one phase high impedance resistor unit



xx06000232.eps



Dimension
mm

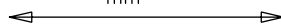
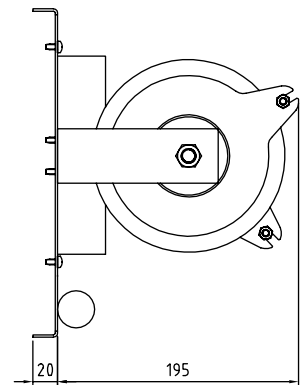


Figure 16: Dimension drawing of a three phase high impedance resistor unit



en06000234.eps

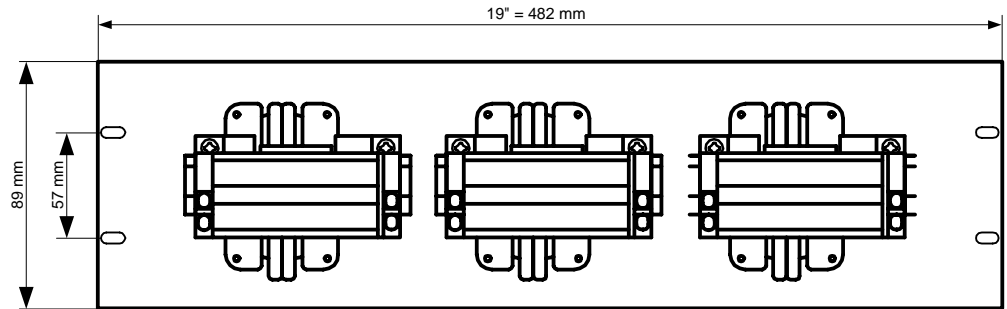
Summation CT

The external auxiliary summation current transformers are used for the cost effective summation type differential principle.



xx06000061.eps

Figure 17: Summation CT



xx06000233.vsd

Figure 18: Dimension drawing of summation current transformers

Interface converter

Converters

The external galvanic data communication converter G.703 makes an optical-to-galvanic conver-

sion for connection to a multiplexer. These units are designed for 64 kbit/s operation. The converter is delivered with 19" rack mounting accessories.



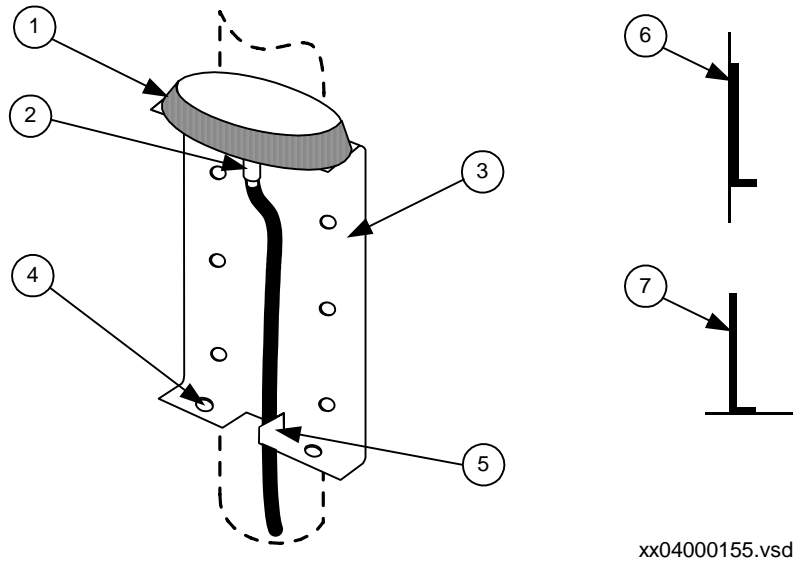
xx06000245.vsd

GPS antenna

In order to receive GPS signals from the satellites orbiting the earth a GPS antenna with applicable cable must be used.

The antenna with a console for mounting on a horizontal or vertical flat surface or on an antenna mast. See [figure 19](#)

A suitable cable is available for ordering.



where:

- 1 GPS antenna
- 2 TNC connector
- 3 Console, 78x150 mm
- 4 Mounting holes 5.5 mm
- 5 Tab for securing of antenna cable
- 6 Vertical mounting position
- 7 Horizontal mounting position

Figure 19: Antenna with console

Table 1: GPS – Antenna and cable

Function	Value
Max antenna cable attenuation	26 db @ 1.6 GHz
Antenna cable impedance	50 ohm
Lightning protection	Must be provided externally
Antenna cable connector	SMA in receiver end TNC in antenna end

Configuration and monitoring tools

PCM 600

Use PCM 600 through all stages of a project, from engineering, configuring, programming and parameter setting to testing, commissioning, documentation and maintenance. You can use it to adjust the default configuration, or to make a new configuration.

Front communication

The front connection cable is used to connect a PC to the RJ45 port on the right side of the LCD-HMI. The cable is a standard crossed-over ethernet cable (RJ45 connectors)

MicroScada tools

The LIB 520 package provides the following main functions:

- User interface for the interaction with the control system and the controlled process
- Automatic supervision and control
- Alarm and event handling
- Data acquisition, calculating and reporting

The high voltage software modules are a complement to the standard MicroSCADA software and provides an easy-to-build and easy-to-use HMI for supervision and control in MicroSCADA.

The software is made for high voltage terminals, and are providing a similar user interface as the LIB 500/510 standard library functions.

See [section "Related documents"](#) for more details about the tool, PC requirements etc.

Ordering**Mounting accessories**

Name	For case size	Quantity	Article number
Protection cover for rear area: consisting of a steel cover with a slot for cable entrance at the bottom part, fixing screws and assembly instruction.	6U x 1/1	<input type="checkbox"/>	1MRK 002 420-AA
	6U x 3/4	<input type="checkbox"/>	1MRK 002 420-AB
	6U x 1/2	<input type="checkbox"/>	1MRK 002 420-AC
	6U x 1/4	<input type="checkbox"/>	1MRK 002 420-AE
19" rack mounting kit: consisting of two mounting angles, fixing screws and assembly instruction.	6U x 1/1	<input type="checkbox"/>	1MRK 002 420-CA
	6U x 3/4	<input type="checkbox"/>	1MRK 002 420-BA
	6U x 1/2	<input type="checkbox"/>	1MRK 002 420-BB
	6U x 1/4	<input type="checkbox"/>	1MRK 002 420-BE
Wall mounting kit: consisting of 2 mounting angles, 2 mounting bars, fixing screws and assembly instruction.	All sizes 6U	<input type="checkbox"/>	1MRK 002 420-DA
Flush mounting kit: consisting of 4 fastener, sealing strip, fixing screws and assembly instruction.	All sizes	<input type="checkbox"/>	1MRK 000 020-Y
Side-by-side mounting kit: consisting of 2 fixing plates, fixing screws and assembly instructions.	All sizes	<input type="checkbox"/>	1MRK 002 420-Z

Note: All kits are complete including screws.

Cases

RHGS6 with door, size 6Ux1/4, color RAL 7035	Quantity:	<input type="checkbox"/>	1MRK 000 315- AG
RHGS12 with door, size 6Ux1/2, color RAL 7035	Quantity:	<input type="checkbox"/>	1MRK 000 315- BH
RHGS30 with door, size 6Ux1/1, color RAL 7035	Quantity:	<input type="checkbox"/>	1MRK 000 315- BB

Test switch module

Selection of a RTXP 24 test switch for each ordered test switch module is required. See applicable IED Buyer's guide for recommendations. Please refer to section "Related documents".

Test switch module RTXP24	Quantity:	<input type="checkbox"/>	1MRK 000 371-FA
Test switch configuration		<input type="checkbox"/>	RK 926 315-BD
		<input type="checkbox"/>	RK 926 315-BX
		<input type="checkbox"/>	RK 926 315-BH
		<input type="checkbox"/>	RK 926 315-AK
		<input type="checkbox"/>	RK 926 315-AC
		<input type="checkbox"/>	RK 926 315-BE
		<input type="checkbox"/>	RK 926 315-BV
		<input type="checkbox"/>	RK 926 315-BL
		<input type="checkbox"/>	RK 926 315-CA
		<input type="checkbox"/>	RK 926 315-AV
On/off switch for the DC-supply	-	<input type="checkbox"/>	RK 795 017-AA

Labels with symbols for RTXP	Quantity:	<input type="checkbox"/>	1MRK 000 132-53
Mounting kit for RTXP 24 in 4U rack assembly	Quantity:	<input type="checkbox"/>	1MRK 000 020-BT

Note: Leads with 20 A Combiflex socket on one end and insulation stripped on the other end must be used to connect the test switch to the terminal. To connect the signal contact of the test switch and the DC switch, leads with 10 A Combiflex socket on one end must be used.

Key switch for settings

Key switch for lock-out of settings via LCD-HMI	Quantity:	<input type="checkbox"/>	1MRK 000 611-A
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Note: To connect the key switch, leads with 10 A Combiflex socket on one end must be used.

Combiflex modules

Auxiliary relays	See related documents
Push button and selector switch	See related documents
Supervision relay	See related documents

Connectors

Female connector	18 terminals of screw compression type, conductor area max 1 x 2.5 mm ² or 2 x 1.0 mm ² , 1 pc	Quantity:	<input type="checkbox"/>	1MKC 860 001-2
Female connector	18 terminals of spring compression type, conductor area max 1 x 1.5 mm ² or 2 x 0.5 mm ² , 1 pc	Quantity:	<input type="checkbox"/>	1MKC 860 005-2
Ferrule	For 2 x 1.5 mm ² conductors in screw compression terminal, 1 pc	Quantity:	<input type="checkbox"/>	1MKC 840 003-4

Bridge connector	For 2 terminals in the current circuit, 1 pc	Quantity:	<input type="checkbox"/>	1MKC 840 002-1
Bridge connector	For 3 terminals, 1 pc	Quantity:	<input type="checkbox"/>	1MKC 840 002-2
Bridge connector	For 4 terminals, 1 pc	Quantity:	<input type="checkbox"/>	1MKC 840 002-3

External resistor unit

High impedance resistor unit 1-ph with resistor and voltage dependent resistor 20-100V	Quantity:	<input type="checkbox"/>	RK795101-MA
High impedance resistor unit 3-ph with resistor and voltage dependent resistor 20-100V	Quantity:	<input type="checkbox"/>	RK795101-MB
High impedance resistor unit 1-ph with resistor and voltage dependent resistor 100-400V	Quantity:	<input type="checkbox"/>	RK795101-CB
High impedance resistor unit 3-ph with resistor and voltage dependent resistor 100-400V	Quantity:	<input type="checkbox"/>	RK795101-DC

Summation CT

3 pcs SLCE 8-1 summation transformers on apparatus plate (2U high), 1/1 A	Quantity:	<input type="checkbox"/>	1MRK 000 643-EA
3 pcs SLCE 8-1 summation transformers on apparatus plate (2U high), 5/1 A	Quantity:	<input type="checkbox"/>	1MRK 000 643-FA
3 pcs SLCE 8-1 summation transformers on apparatus plate (2U high), 2/1 A	Quantity:	<input type="checkbox"/>	1MRK 000 643-GA

Interface converter

Interface converter (for remote end data communication)

External interface converter from C37.94 to G703 including 1U 19" rack mounting accessories	Quantity:	<input type="checkbox"/>	1MRK 002 245-AA
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GPS antenna

GPS antenna and mounting details

GPS antenna, including mounting kits	Quantity:	<input type="checkbox"/>	1MRK 001 640-AA
Cable for antenna, 20 m	Quantity:	<input type="checkbox"/>	1MRK 001 665-AA
Cable for antenna, 40 m	Quantity:	<input type="checkbox"/>	1MRK 001 665-BA

Configuration and monitoring tools

Front connection cable between LCD-HMI and PC	Quantity:	<input type="checkbox"/>	1MRK 001 665-CA
LED Label special paper A4, 1 pc	Quantity:	<input type="checkbox"/>	1MRK 002 038-CA
LED Label special paper Letter, 1 pc	Quantity:	<input type="checkbox"/>	1MRK 002 038-DA
Protection and control IED manager PCM 600			
PCM 600 ver. 1.1, IED Manager	Quantity:	<input type="checkbox"/>	1MRK 003 395-AA
PCM 600 ver. 1.1, Engineering, IED Manager + CAP 531	Quantity:	<input type="checkbox"/>	1MRK 003 395-BA
PCM 600 ver. 1.1, Engineering Pro, IED Manager + CAP 531 + CCT for IEC 61850-8-1 configuration of IED	Quantity:	<input type="checkbox"/>	1MRK 003 395-CA

MicroScada tools

LIB 520

[See related documents](#)

Related documents

Technical overview brochure	
Combiflex, connection and installation components	1MRK 513 003-BEN
Combitest	1MRK 512 001-BEN
Auxiliary, signalling and tripping relays	1MRK 508 015-BEN
Auxiliary relays	1MRK 508 006-BEN
Bistable relays	1MRK 508 017-BEN
Push button and selector switch	1MRK 513 016-BEN
Supervision relay	1MRK 508 024-BEN
LIB 520	1MRK 511 182-BEN
RED670	1MRK 505 164-BEN
REL670	1MRK 506 264-BEN
RET670	1MRK 504 080-BEN
REC670	1MRK 511 176-BEN
REB 670	1MRK 505 172-BEN