PacT Series

VigiPacT RHB Protection Relay Type B

User Guide

PacT Series offers world-class breakers and switches

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Schneider Electric

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a "Danger" or "Warning" safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠ DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result** in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

The aim of this document is to provide users, installers, and maintenance personnel with the technical information needed to operate the VigiPacT RHB protection relay in compliance with the IEC standards.

Validity Note

This document is valid for the VigiPacT RHB relay and VigiPacT RHB toroids, without restrictions of firmware version.

Online Information

The information contained in this guide is likely to be updated at any time. Schneider Electric strongly recommends that you have the most recent and up-to-date version available on www.se.com/ww/en/download/.

The technical characteristics of the devices described in the present document also appear online. To access the information online, go to the Schneider Electric home page.

Related Documents

Title of documentation	Reference number
VigiPacT RHB – Residual-Current Relay with Separate Toroid – Instruction Sheet	MFR39443
ComPacT NSX – Circuit Breakers and Switch-Disconnectors 100-630 A – User guide	DOCA0187EN
ComPacT NSXm – Circuit Breakers, Earth-Leakage Circuit Breakers, and Switch-Disconnectors – User guide	DOCA0185EN
Earth Fault Protection Guide	CA908066E
VigiPacT Catalog	LVPED208009EN

You can download these technical publications and other technical information from our website at www.se.com/ww/en/download/.

Introduction to VigiPacT RHB Relay

Introduction

PacT Series Master Range

Future-proof your installation with Schneider Electric's low-voltage and medium-voltage PacT Series. Built on legendary Schneider Electric innovation, the PacT Series comprises world-class circuit breakers, switches, residual current devices and fuses, for all standard and specific applications. Experience robust performance with PacT Series within the EcoStruxure-ready switchgear, from 16 to 6300 A in low-voltage and up to 40.5 kV in medium-voltage.

Overview

The VigiPacT RHB relay provides earth-fault protection for all types of AC/DC installations, including power distribution, subdistribution, and industrial control systems.

The VigiPacT RHB relay is installed on the front of switchboards and panels, and provides valuable assistance in the maintenance of electrical installations.

The VigiPacT RHB relay devices operate on TN and TT systems. These systems are in particular, the loads containing six-pulse rectifiers or one-way rectifiers with smoothing, such as converters, battery chargers, construction site equipment with frequency-controlled drives.

The VigiPacT RHB relay is compatible with the following circuit breakers:

- ComPacT NSX100-250
- ComPacT NSX400-630
- ComPacT NSXm16-160

The VigiPacT RHB relay is compliant with the standard IEC/EN 60947-2 annex M.

For more information on how to design efficient earth-fault protection with the VigiPacT RHB Type B relays, refer to the Earth Fault Protection Guide.

Features

The VigiPacT RHB relay is used together with a toroid. The main features of VigiPacT RHB relay are:

- Provides earth-fault protection function with two separate adjustable thresholds (pre-alarm and alarm), with adjustable time delays
- Measures AC/DC r.m.s value of sensitive residual current Type B according to the standard IEC/EN 60947-2 annex M
- Displays measured value via multi-functional LCD display
- Indicates alarms via LEDs (PRE-AL and ALARM) and changeover contacts (pre-alarm relay **K1** and alarm relay **K2**)
- Provides password protection against unauthorised parameter changing
- Stores the value of the earth-leakage current measured for the last alarm detected in the memory
- Provides self-test to monitor the toroid connection

Toroid Selection

> ### ⚠ WARNING
>
> **HAZARD OF NON-PROTECTION OR TRIPPING TIME ABOVE 50 MS**
>
> - The toroid connection to the VigiPacT RHB relay must be selected according to the application.
> - Do not use the VigiPacT RHB relay in association with the ComPacT NSXm circuit breaker with earth-leakage protection set to 30 mA.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**
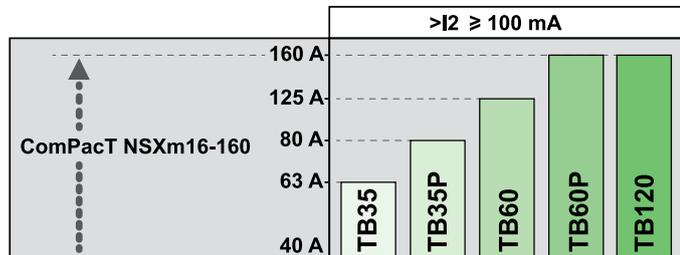
For compliance with the standard IEC/EN 60947-2 annex M, use the tables below to select the toroid adapted to your application, according to:

- the alarm threshold **>I2** of the earth-leakage protection
- the rated current of the ComPacT NSX or ComPacT NSXm circuit breaker

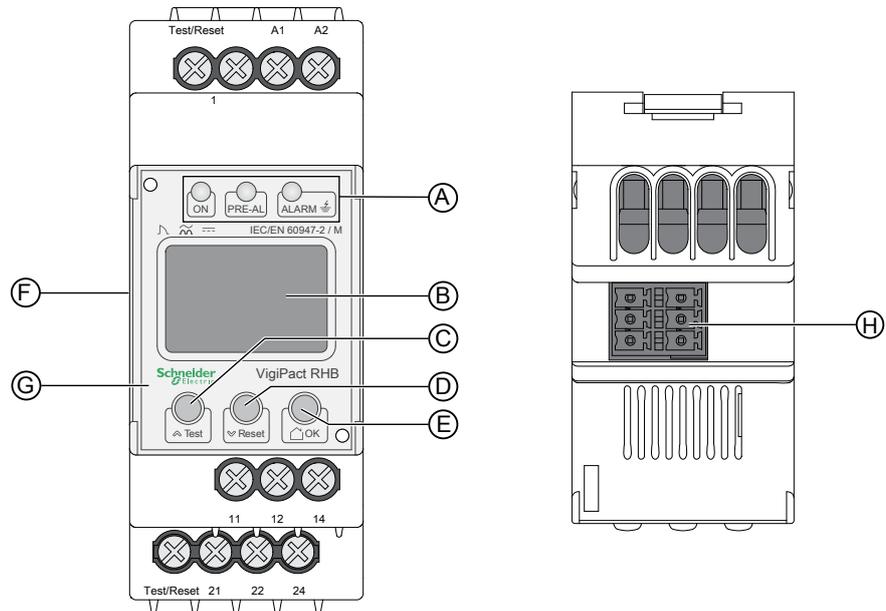### Toroid Selection with ComPacT NSX Circuit Breaker
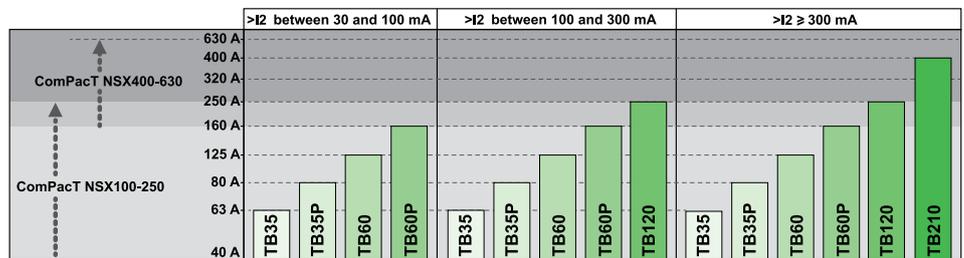
Toroid Selection with ComPacT NSXm Circuit Breaker

The tripping time of the VigiPacT RHB relay in association with a ComPacT NSXm circuit breaker with earth-leakage protection set to 30 mA is incompatible with the standard IEC/EN 60947-2 annex M.

Hardware Description

VigiPacT RHB Relay

A Status LEDs: ON, PRE-AL, ALARM

B Multi-functional LCD display

C Test/UP button

D Reset/DOWN button

E Home or OK button

F QR code to access device information

G Lead-seal cover

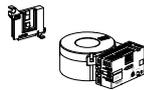**H** Socket for toroid connection with the wiring kit
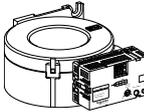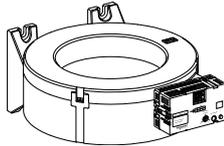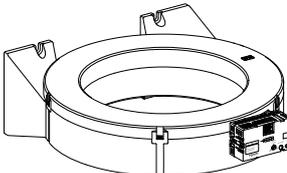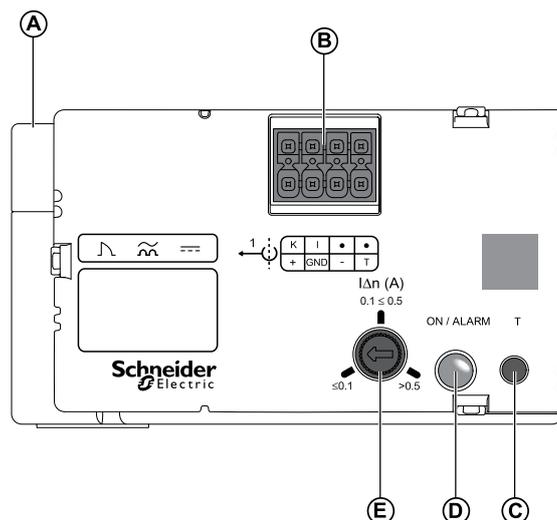
VigiPacT RHB Toroids

> ⚡⚠ **DANGER**
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**
>
> • Do not connect or disconnect the cable connecting the toroid to the relay when the monitored power supply is on.
> • Do not disconnect the electronic module on the toroid.
>
> **Failure to follow these instructions will result in death or serious injury.**

The table below shows the list of supported toroids:

Toroid		Diameter
TB35 (LV481011)		35 mm
TB35P (LV481015)		
TB60 (LV481012)		60 mm
TB60P (LV481016)		
TB120 (LV481013)		120 mm
TB210 (LV481014)		210 mm

A Toroid

B Socket for relay connection with the wiring kit

C Test button

D Status LED: ON/ALARM

E Measuring range setting dial

Earth-Fault Protection Function

The main functions of VigiPacT RHB relay are:

- Measures the earth-leakage current detected by the toroid.
- Displays the earth-leakage current.
- Trips the installation protection circuit breaker through an MN or MX voltage release if the earth-leakage current exceeds the alarm threshold **>I2** for a time greater than the time delay **ton2**.
- Implements two earth-leakage current thresholds, one corresponding to a pre-alarm and another to an alarm.

Alarm Detection

The alarm threshold **>I2** corresponds to an earth-leakage current that is out of the normal condition for the installation.

An alarm is active when the measured earth-leakage current is greater than the set alarm threshold **>I2** for a period of time greater than the set alarm time delay **ton2** (in milliseconds or seconds).

When an alarm is active:

- K1 and K2 relays are activated
- **PRE-AL** and **ALARM** LEDs are switched on
- the value of earth-leakage current blinks on the LCD display

Pre-alarm Detection

The pre-alarm threshold **>I1** corresponds to an earth-leakage level that must be eliminated before it becomes hazardous for the installation.

A pre-alarm is active when the measured earth-leakage current is greater than the set pre-alarm threshold **>I1** for a period of time greater than the set pre-alarm time delay **ton1** (in milliseconds or seconds).

When a pre-alarm is active:

- K1 relay is activated
- **PRE-AL** LED is switched on
- the value of earth-leakage current blinks on the LCD display

Time Delays

The time delays **ton1** and **ton2** delay the activation of the alarm and pre-alarm.

If the earth-leakage current increases above the alarm threshold value **>I2**, the alarm is activated after the time delay **tan** = **tae** + **ton**, where

- **tae**: relay operating time (For more details on operating time, refer section Technical Characteristics, page 13).
- **ton**: time delay set

  NOTE: If the alarm threshold **>I2** is set to 30 mA (protection of persons), the time delay **ton2** is automatically and invariably set to 0 s.

Settings

Parameter	Settings	Settings range	Factory settings
Threshold	**>I2** alarm threshold	30 mA to 100 mA	1 mA
		100 mA to 1 A	10 mA
		1 A to 3 A	100 mA
	>I1 pre-alarm threshold	50...100% of >I2	50%
Time delay	**ton2** time delay for alarm relay **K2**	0..10 s	0 s
	ton1 time delay for pre-alarm relay **K1**	0..10 s	1 s
SEt	Password	off/0…999	on (password value: 0)

Password Management

The VigiPacT RHB relay provides password protection against unauthorised parameter changing.

The parameters are set via the menu buttons available on the VigiPacT RHB relay. When the password protection is set to **on**, the password is required before changing the parameter. When correct password is entered, the password is memorised until the user stays in the menu.

Alarm Management

The alarm and pre-alarm are latched.

The latched alarm or pre-alarm must be reset locally by pressing the **Reset** button for more than 1.5 s on VigiPacT RHB relay or remotely by pressing the external button for less than 1.5 s.

> **NOTE:** The latched alarm or pre-alarm resets if power supply is interrupted.

Automatic Self Test

The VigiPacT RHB relay monitors continuously:
- the toroid connection
- the toroid settings
- the relay internal functions

When a malfunction is detected:
- K1 and K2 relays are activated
- the 3 LEDs are blinking
- an error code is displayed on the screen. For more information, refer section Troubleshooting, page 34.

Manual Test

Press and hold the **Test** button for more than 2 s to carry out a manual test.

The VigiPacT RHB relay:
- simulates the detection of an alarm and activates the K1 and K2 relays. For more information, refer section Manual Test, page 31.
- checks the toroid connection and settings. For more information, refer section Troubleshooting, page 34.

While pressing and holding the **Test** button, all relevant display elements are shown on the LCD display.

Technical Characteristics

System Characteristics

Characteristics	Values
System voltage	0...690 Vac/dc, 0...2000 Hz
System earthing arrangements	TT, TN

Electrical Characteristics

Characteristics		Values
Supply voltage	Supply voltage range	100...250 Vac/dc
	Operating range supply voltage	70...300 Vac/dc
	Frequency range	DC, 42...460 Hz
	Protective separation (reinforced insulation) between	(A1, A2) - (k/l, T/R) - (11, 12, 14) - (21, 22, 24)
	Voltage test according to IEC 61010-1	2 kV
	Power consumption	≤ 6.5 VA
Measuring circuit	External measuring current transformer	TB35/TB35P, TB60/TB60P, TB120, TB210
	Rated insulation voltage (measuring current transformer)	800 V
	Operating characteristic according to IEC 62020 and IEC/TR 60755	Type B
	Rated frequency	0...2000 Hz
	Operating uncertainty	0...35%
Operating time	Operating time **tae** at **Idn** = **>I2**	≤ 180 ms
	Operating time **tae** at **Idn** = 5 x **>I2**	≤ 23 ms
Display	Display range, measured value AC/DC	0...6 A
	Error of indication	±10%
Inputs/outputs	Cable length for external test/reset button	0...3 m
	Cable length for outputs (K1 and K2 relays)	0...3 m
Cable lengths for measuring current transformers	Pre-fabricated cables	LV481017: 1 m
		LV481018: 2.5 m

Output Contact Characteristics as Defined by IEC/EN 60947-5-1

Characteristics	Values				
Number of switching elements	2 x 1 changeover contact				
Electrical endurance, number of cycles	10000				
Contact data	According to IEC/EN 60947-5-1				
Utilization category	**AC13**	**AC14**	**DC12**	**DC12**	**DC12**
Rated operational voltage	230 V	230 V	24 V	110 V	220 V
Rated operational voltage UL	200 V	200 V	24 V	110 V	200 V
Rated operational current	5 A	3 A	1 A	0.2 A	0.1 A
Minimum contact rating	1 mA at AC/DC ≥ 10 V				

Mechanical Characteristics

Characteristics	Values
Operating mode	Continuous operation
Position of normal use	Display-oriented
Degree of protection, internal components (IEC 60529)	IP30
Degree of protection, terminals (IEC 60529)	IP20
Enclosure material	Polycarbonate
Flammability class	UL94V-0
DIN rail mounting according to	IEC 60715
Screw mounting	2 x M4 with mounting clip
Hardware/Firmware version	D611-1.03
Weight	≤ 150 g

Environmental/EMC Characteristics

Characteristics		Values
EMC		IEC/EN 60947-2 annex M
Ambient temperatures	Operating temperature	-25...55 ˚C
	Transport	-25...70 ˚C
	Long-term storage	-25 ...55 ˚C
Classification of climatic conditions according to IEC 60721	Stationary use (IEC 60721-3-3)	3K23 (except condensation and formation of ice)
	Transport (IEC 60721-3-2)	2K11
	Long-term storage (IEC 60721-3-1)	1K22
Classification of mechanical conditions according to IEC 60721	Stationary use (IEC 60721-3-3)	3M11
	Transport (IEC 60721-3-2)	2M4
	Long-term storage (IEC 60721-3-1)	1M12

Operation

Human Machine Interface
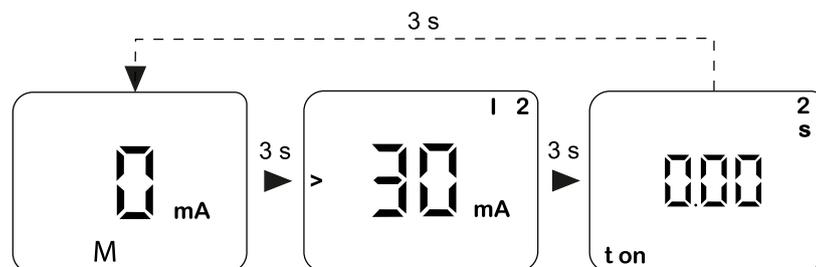
HMI Menu Structure
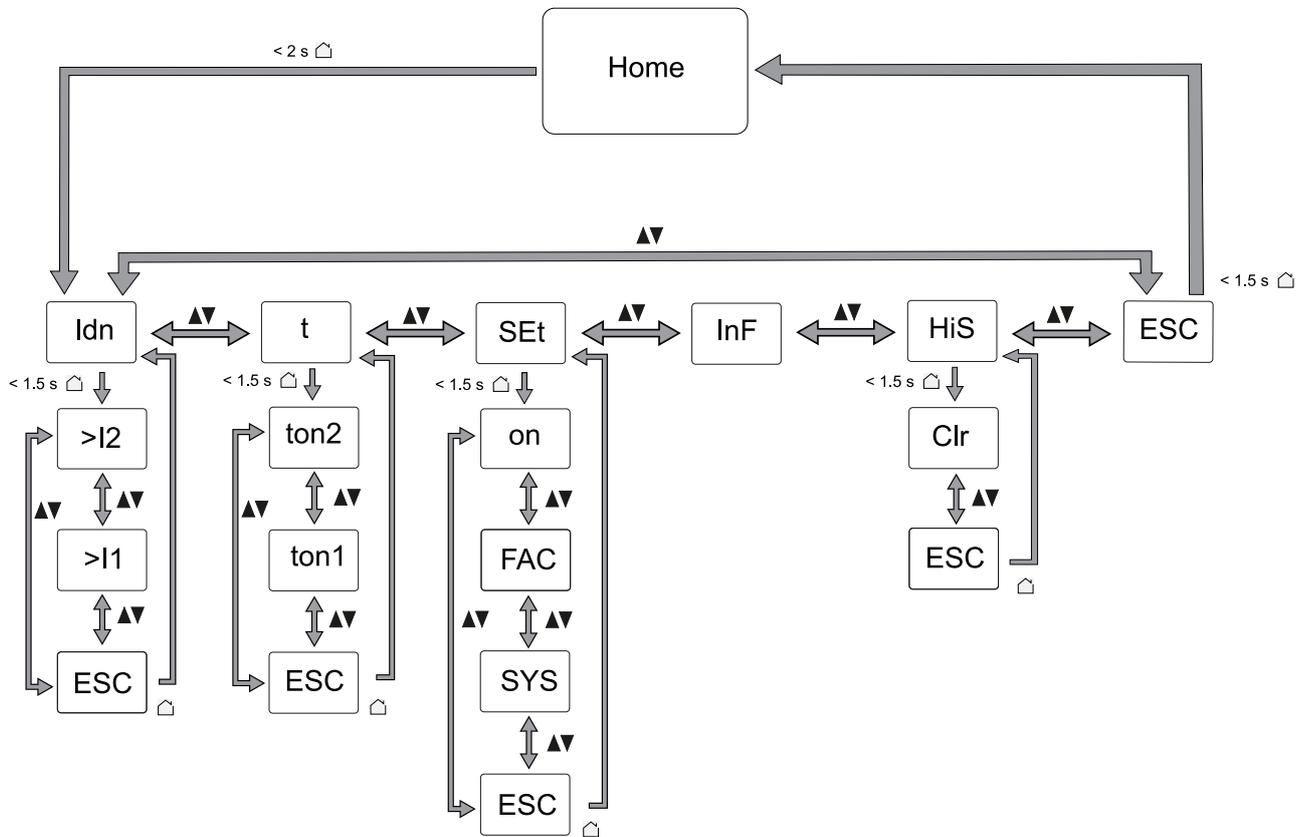
Press and hold the **Home** button for more than 1.5 s to go one menu level back.

Home Screen

The VigiPacT RHB relay displays the following values alternatively every 3 seconds on the Home screen:

- the measured residual current **Idn**
- the alarm threshold **>I2**
- the time delay **ton2**

Error Display

In the event of an internal malfunction, all three LEDs flash and the LCD display shows an error code (E.01…E...).

For more information to know about the error codes, refer section Troubleshooting, page 34.

Menus and Submenus

Menu (level 1)	Submenu (level 2)	Adjustable parameter
Idn	>I2	Alarm threshold (>I2)
	>I1	Pre-alarm threshold (>I1), expressed as percentage of alarm threshold (>I2)
t	ton2	Alarm time delay (ton2) for alarm relay K2
	ton1	Pre-alarm time delay (ton1) for pre-alarm relay K1
SEt	on	Parameter setting through password
	FAC	Restore factory settings
	SYS	Service menu (locked)
InF	-	Display hardware/firmware version
HiS	Clr	Display and clear the value stored in the memory of the earth-leakage current measured for the last alarm detected.
ESC	-	Exit the menu and return to Home screen

HMI Description

Overview
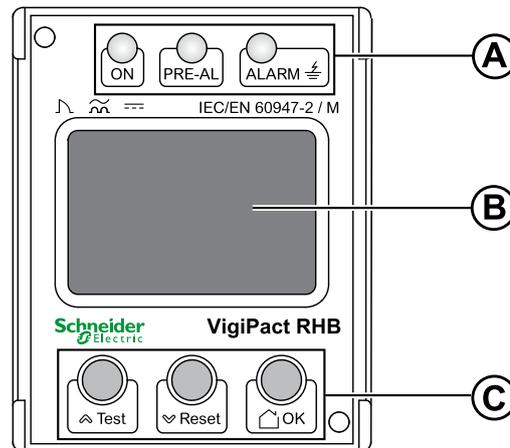
Legend	Display	Description
A	Status LEDs	Indicates power on, and the status of pre-alarm, and alarm.
B	Multifunctional LCD display	Displays the parameter settings and the measurement values.
C	Navigation buttons	Allows to navigate.

Status LED

Description	Status LED indication		
	ON	**PRE-AL**	**AL**
Normal operation	Steady green	OFF	OFF
Internal malfunction detected by the relay	Blinking green	Blinking yellow	Blinking red
>I1 pre-alarm threshold reached	Steady green	Steady yellow	OFF
>I2 alarm threshold reached	Steady green	Steady yellow	Steady red

Buttons

Button	Description

⌃ Test	**Two functions:**
	• Test button (> 2 s): Starts a manual test and indicates the display element in use.
	• Navigation button (< 1.5 s):
	  ◦ allows to move to previous menu/submenu item.
	  ◦ allows to increase the numerical value while setting the parameters.

⌄ Reset	**Two functions:**
	• Reset button (> 1.5 s): Acknowledges the latched alarm.
	• Navigation button (< 1.5 s):
	  ◦ allows to move to next menu/submenu item.
	  ◦ allows to decrease the numerical value while setting the parameters.

⌂OK	**Two functions:**
	• Home button (> 2 s): Enters into the menu level items.
	• Validation button (< 1.5 s):
	  ◦ allows to save the parameter value.
	  ◦ allows to enter into the settings.

Parameter Modification

To modify the value of a parameter, follow either of the methods described below:
- Select a value in the list.
- Modify the numerical value, digit by digit.

Selecting a Value in a List

To select a value from the list of settings, use the menu buttons as described below:

1. Press the ⌃ and ⌄ buttons to select the desired value.
2. Press the **OK** button to save the selected setting value.

Modifying a Numerical Value

The numerical value of a parameter is made up of digits from 0 to 9.

To modify the numerical value, use the menu buttons as described below:

1. Press the ⌃ and ⌄ buttons to modify the numerical value of the selected digit.
2. Press the **OK** button to save the value of the selected digit.

   Result: The following digit is selected and can be modified as the first digit. If there is no other digit to set, the setting value is saved.

   NOTE:
   - After modifying the numerical value, press the **OK** button to save the value.
   - To increase or decrease the numerical value at a higher speed, press the ⌃ or ⌄ button for a longer duration of time.

Pressing Multiple Buttons

If multiple buttons are pressed simultaneously, no action is performed and the pressed buttons are ignored except for the password reset function. Release the pressed buttons in order to press another button.
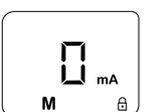
Description of Screens

> ## ⚠ WARNING
>
> **HAZARD OF NON-TRIPPING**
>
> - Protection setting adjustments must be done by qualified electrical personnel.
> - The toroid must be connected to the corresponding relay before the first use and before commissioning of the protected installation.
> - The relay must be powered prior to the protected installation.
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**
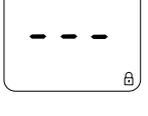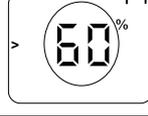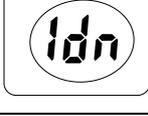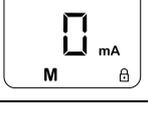
Threshold Settings

The threshold settings (**Idn**) menu allows you to set the following parameters:

- >I2, alarm threshold
- >I1, pre-alarm threshold

Setting the >I2 Alarm Threshold

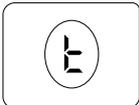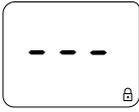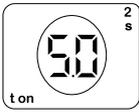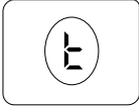| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	
2	Press the **OK** button. **Result: >I2** flashes and the value of alarm threshold is displayed on the screen.	
3	Press the **OK** button to change the value of alarm threshold. **NOTE:** If the password protection is set to **on**, then it is required to enter the password to change the value. Enter the password by using ⌃ or ⌄ button and press **OK** button.	
4	Use the ⌃ and ⌄ buttons to set the appropriate value of alarm threshold.	
5	Press the **OK** button to save the value of alarm threshold. **Result: >I2** flashes and the new value of alarm threshold is displayed on the screen.	
6	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Idn** flashes on the screen.	
7	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	
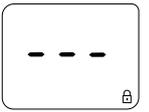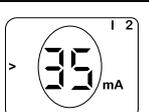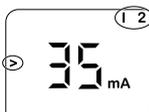
Setting the >I1 Pre-Alarm Threshold

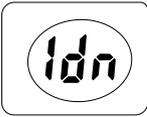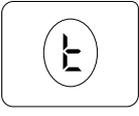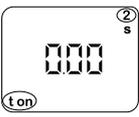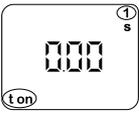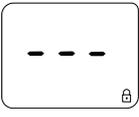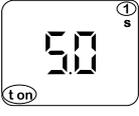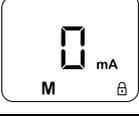| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	
2	Press the **OK** button. **Result: >I2** flashes and the value of alarm threshold is displayed on the screen.	
3	Press the ⌄ button one time to select the pre-alarm threshold **> I1** submenu. **Result: > I1** flashes and the value of pre-alarm threshold is displayed on the screen.	
4	Press the **OK** button to change the value of pre-alarm threshold. **NOTE:** If the password protection is set to **on**, then it is required to enter the password to change the value. Enter the password by using ⌃ or ⌄ button and press **OK** button.	
5	Use the ⌃ and ⌄ buttons to set the appropriate value of pre-alarm threshold.	
6	Press the **OK** button to save the value of pre-alarm threshold. **Result: >I1** flashes and the new value of pre-alarm threshold is displayed on the screen.	
7	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Idn** flashes on the screen.	
8	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	

Time Delay Settings

The time delay settings (**t**) menu allows you to set the following parameters:

- ton2 time delay for alarm relay **K2**
- ton1 time delay for pre-alarm relay **K1**

Setting ton2 Time Delay

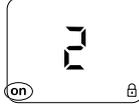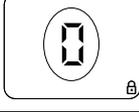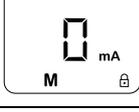| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	
2	Press the ⌄ button one time to select **t** menu.	
3	Press the **OK** button. **Result: ton** and **2** flashes and the value of time delay **ton2** is displayed on the screen. NOTE: If the alarm threshold **>I2** is set to 30 mA (protection of persons), the time delay **ton2** is automatically and invariably set to 0 s.	
4	Press the **OK** button to change the value of time delay **ton2**. NOTE: If the password protection is set to **on**, then it is required to enter the password to change the value. Enter the password by using ⌃ or ⌄ button and press **OK** button.	
5	Use the ⌃ and ⌄ buttons to set the appropriate value of time delay **ton2**.	
6	Press the **OK** button to save the value of time delay **ton2**. **Result: ton** and **2** flashes, and the new value of time delay **ton2** is displayed on the screen.	
7	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: t** flashes on the screen.	
8	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	

Setting ton1 Time Delay

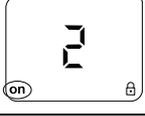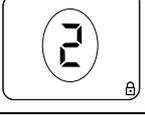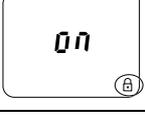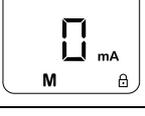| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	*Idn*
2	Press the ⌄ button one time to select **t** menu.	*t*
3	Press the **OK** button. **Result: ton** and **2** flashes and the value of time delay **ton2** is displayed on the screen.	② s 000 t on
4	Press the ⌄ button one time to select the time delay **ton1** submenu. **Result: ton** and **1** flashes and the value of time delay **ton1** is displayed on the screen.	① s 000 t on
5	Press the **OK** button to change the value of time delay **ton1**. **NOTE:** If the password protection is set to **on**, then it is required to enter the password to change the value. Enter the password by using ⌃ or ⌄ button and press **OK** button.	- - - 🔒
6	Use the ⌃ and ⌄ buttons to set the appropriate value of time delay **ton1**.	1 s 50 t on
7	Press the **OK** button to save the value of time delay **ton1**. **Result: ton** and **1** flashes, and the new value of time delay **ton1** is displayed on the screen.	① s 50 t on
8	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: t** flashes on the screen.	*t*
9	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	0 mA M 🔒

Device Control Parameter Settings

The device control parameter settings (**SEt**) menu allows you to:
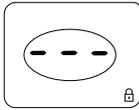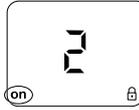
- Set the password protection
- Reset to factory settings

Activating the Password Protection

Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	*Idn*
2	Press the ⌄ button two times to select **SEt** menu.	*SEt*
3	Press the **OK** button. **Result:** The lock icon flashes and the password setting **OFF** is displayed on the screen.	*OFF* 🔒
4	Press the **OK** button to change the password setting to **on**.	*OFF* off 🔒
5	Use the ⌃ and ⌄ buttons to change the password setting to **on**.	*2* on 🔒
6	Press the **OK** button. **Result:** The existing password flashes on the screen.	*2* 🔒
7	Use the ⌃ and ⌄ buttons to enter the new password.	*0* 🔒
8	Press the **OK** button to save the new password. **Result:** Lock icon flashes and the password setting **on** is displayed on the screen.	*on* 🔒
9	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: SEt** flashes on the screen.	*SEt*
10	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	*0* mA M 🔒

Changing the Password

Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	*Idn*
2	Press the ⌄ button two times to select **SEt** menu.	*SEt*
3	Press the **OK** button. **Result:** Lock icon flashes and the password setting **on** is displayed on the screen.	*on* 🔒
4	Use the ⌃ and ⌄ buttons to enter the password to unlock the password protection setting.	*- - -* 🔒
5	Press the **OK** button to validate the entered password. **Result:** If the password is validated, the password setting **on** flashes on the screen.	*2* (on) 🔒
6	Use the ⌃ and ⌄ buttons to set a new password.	*2* 🔒
7	Press the **OK** button to save the new password. **Result:** Lock icon flashes and the password setting **on** is displayed on the screen.	*on* 🔒
8	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: SEt** flashes on the screen.	*SEt*
9	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	*0* mA M 🔒
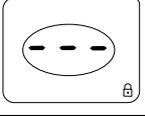
Deactivating the Password Protection

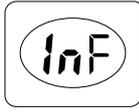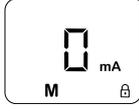| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	*Idn*
2	Press the ⌄ button two times to select **SEt** menu.	*SEt*
3	Press the **OK** button. **Result:** Lock icon flashes and the password setting **on** is displayed on the screen.	*On* 🔒
4	Use the ⌃ and ⌄ buttons to enter the password to disable the password protection.	*- - -* 🔒
5	Press the **OK** button to validate the entered password. **Result:** If the password is validated, the password setting **on** flashes on the screen.	*2* on 🔒
6	Use the ⌃ or ⌄ button and set the password setting to **OFF** to deactivate the password protection setting.	*OFF* off 🔒
7	Press the **OK** button. **Result:** Password protection setting is deactivated, and the password setting **OFF** is displayed on the screen.	*OFF* 🔒
8	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: SEt** flashes on the screen.	*SEt*
9	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	*0* mA M 🔒
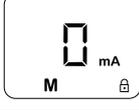
Restoring Factory Settings

For more information, refer section Factory Settings, page 12.

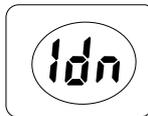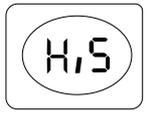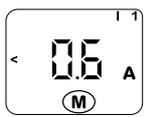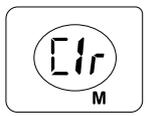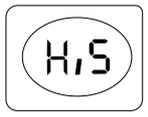| Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	Idn
2	Press the ⌄ button two times to select **SEt** menu.	SEt
3	Press the **OK** button. **Result:** Lock icon flashes and the password setting **on** is displayed on the screen.	on 🔒
4	Press the ⌄ button one time to select **FAC** submenu.	FAC
5	Use the ⌃ or ⌄ button to enter the password.	- - - 🔒
6	Press the **OK** button. **Result: no** flashes on the screen.	no
7	Use the ⌃ or ⌄ button to set the factory settings to **YES**.	YES
8	Press the **OK** button to apply the factory settings. **Result:** • **run** is displayed on the screen. • The factory settings of VigiPacT RHB relay are restored. After the factory settings are restored, the relay resets and the Home screen is displayed.	run
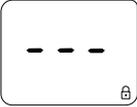
Device Information

The device information (**InF**) menu allows you to get the information about the hardware and firmware versions. After activating this menu, the data will be displayed as a scrolling text. You can select the individual data sections by using the ⌃ or ⌄ button.

Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	Idn
2	Press the ⌄ button three times to select **InF** menu.	InF
3	Press the **OK** button. **Result:** The relay hardware and firmware versions scroll on the screen. **NOTE:** Press the ⌃ or ⌄ button to manually scroll through the hardware and firmware versions.	d...
4	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: InF** flashes on the screen.	InF
5	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	0 mA M

History Memory

The history memory (**HiS**) menu allows you to get the value of the earth-leakage current measured for the last alarm detected and stored in the memory.

Step	Action	Screen
1	Press the **OK** button for more than 2 s. **Result: Idn** flashes on the screen.	_Idn_
2	Press the ⌄ button four times to select **HiS** menu.	_HiS_
3	Press the **OK** button. **Result: M** flashes and the value of the earth-leakage current measured for the last alarm detected is displayed on the screen.	_< 0.6 A_ _I 1_ _M_
4	Press the ⌄ button. **Result:** When **Clr** flashes on the screen, the history memory can be cleared by pressing the **OK** button.	_Clr_ _M_
5	To exit the current submenu, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: HiS** flashes on the screen.	_HiS_
6	To exit the menu and display the Home screen, select the **ESC** submenu by using ⌃ or ⌄ button and press **OK** button. **Result: Home** screen is displayed.	_0 mA_ _M_ 🔒
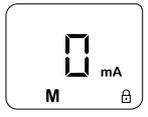
Commissioning and Maintenance

Insulation and Dielectric Strength Tests

NOTICE
HAZARD OF RELAY DAMAGE
The power supply of the VigiPacT RHB relay must be disconnected before performing the dielectric test.
Failure to follow these instructions can result in equipment damage.

Insulation and dielectric strength tests are carried out before the switchboard is delivered. These tests are subject to the currently applicable standards.

Dielectric strength tests impose great stress on the equipment and can cause damage if performed incorrectly. In particular:

- Reduce the value used for the test voltage according to the number of consecutive tests on the same piece of equipment.

- Disconnect the power supply of the VigiPacT RHB relay and other electronic equipment if necessary before dielectric test.
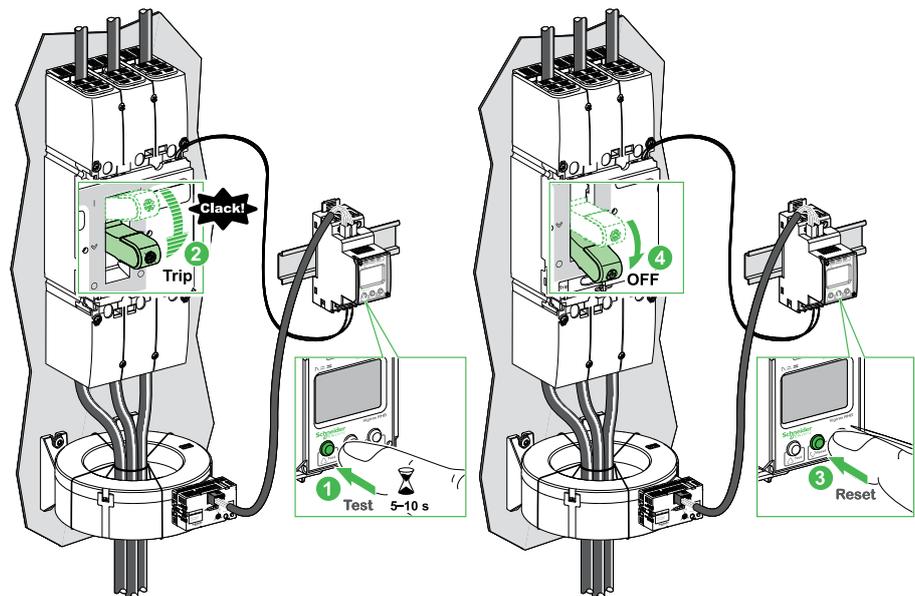
Manual Test

Overview

Perform the manual test:

- after installation during commissioning (mandatory)
- following any severe electrical fault
- at regular intervals. Schneider Electric recommends that the test is carried out:
  - Every three months in case of absence of local regulation.
  - Once a month for devices in corrosive, dusty, or harsh environments.

Procedure

Follow the steps to perform the manual test:

1. Press the **Test** button on the relay for more than 2 s.
2. Check that the circuit breaker trips.
3. Press the **Reset** button on the relay.
4. Reset the circuit breaker.
5. Close the circuit breaker.

Toroid Calibration

Overview

The toroids are calibrated in factory.

> **⚡⚠️⚠️DANGER**
>
> **HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**
>
> Turn off the main circuit breaker in the open (O) position before performing the toroid calibration.
>
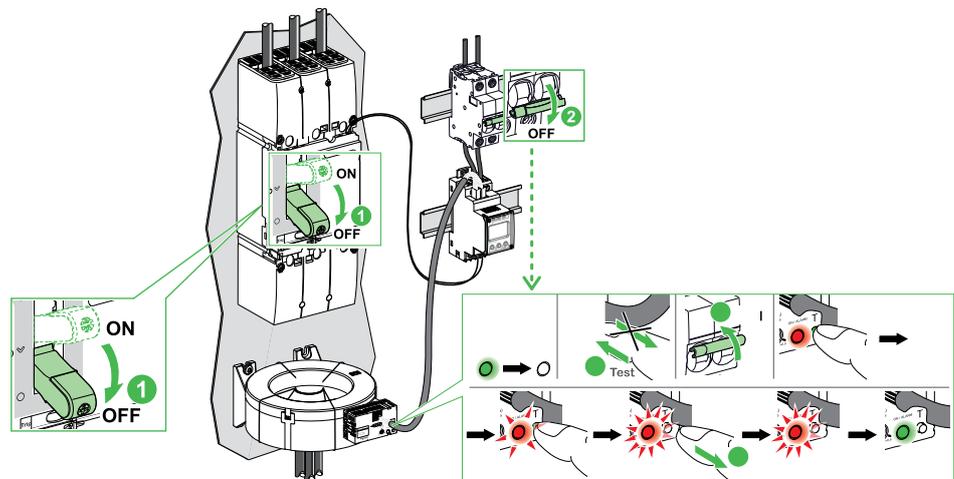> **Failure to follow these instructions will result in death or serious injury.**

> **⚠️WARNING**
>
> **HAZARD OF NON-TRIPPING**
>
> The toroid must be recalibrated:
> - following any severe electrical fault
> - periodically, once a year
>
> **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Procedure

1. Turn off the main circuit breaker in the open (O-Off) position.

2. Turn off the circuit breaker of the relay in the open (O-Off) position.
   Result: The toroid status LED switches off.

3. Press the **Test** button on the toroid and maintain it pushed.

4. Turn on the circuit breaker of the relay in the closed (I-On) position.
   Result: The toroid is ready for calibration when the status LED of toroid blinks red slowly.

5. Release the **Test** button on the toroid to start the calibration.

    Result:

    •   the status LED of toroid blinks red quickly during the calibration.

    •   the status LED of toroid turns steady green when the calibration is finished.

    •   The message E.01 is displayed on the relay. The 3 LEDs on the relay blink and the pre-alarm relay **K1** and alarm relay **K2** change state.

6. Press the **Reset** button on the relay.

    Result:

    •   The **Home** screen is displayed on the relay. The 3 LEDs on the relay stop blinking and the pre-alarm relay **K1** and alarm relay **K2** change state.

    •   The relay is ready for operation.

7. Close the main circuit breaker.

Troubleshooting

If the relay detects an internal error, the following error codes appear on the display.

Error code	Problem	Solution
E.01	Toroid disconnected, or incorrect toroid setting detected by the automatic self test.	- Check the connection of the toroid to the relay for short circuit or interruption. - Check the toroid settings. - Press the **Reset** button on the relay once the error is resolved.
E.02	Toroid disconnected, or incorrect toroid setting detected during manual test.	- Check the connection of the toroid to the relay for short circuit or interruption. - Check the toroid settings. - Press the **Reset** button on the relay once the error is resolved. - Run the manual test again.
E...	Internal malfunction detected by the automatic self test.	- Reset the relay to factory settings. For more information, refer section Restoring Factory Settings, page 27. - If the error persists, contact your Schneider Electric field service representative.

As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

DOCA0160EN-00