Earth leakage circuit breaker with automatic reclosing and measurement system

RECmax-CVM

INSTRUCTION MANUAL

(M175B01-03-17C)

CE

SAFETY PRECAUTIONS

Follow the warnings described in this manual with the symbols shown below.

	**DANGER** Warns of a risk, which could result in personal injury or material damage.

	**ATTENTION** Indicates that special attention should be paid to a specific point.

If you must handle the unit for its installation, start-up or maintenance, the following should be taken into consideration:

	Incorrect handling or installation of the unit may result in injury to personnel as well as damage to the unit. In particular, handling with voltages applied may result in electric shock, which may cause death or serious injury to personnel. Defective installation or maintenance may also lead to the risk of fire. Read the manual carefully prior to connecting the unit. Follow all installation and maintenance instructions throughout the unit's working life. Pay special attention to the installation standards of the National Electrical Code.
	**Refer to the instruction manual before using the unit** In this manual, if the instructions marked with this symbol are not respected or carried out correctly, it can result in injury or damage to the unit and /or installations.

CIRCUTOR, SA reserves the right to modify features or the product manual without prior notification.

DISCLAIMER

CIRCUTOR, SA reserves the right to make modifications to the device or the unit specifications set out in this instruction manual without prior notice.

CIRCUTOR, SA on its web site, supplies its customers with the latest versions of the device specifications and the most updated manuals.

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	**CIRCUTOR,** recommends using the original cables and accessories that are supplied with the device.

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REVISION LOG

Table 1: Revision log.

Date	Revision	Description
10/17	M175B01-03-17A	Initial Version
11/17	M175B01-03-17B	Changes in the following sections: 7.3.2.- 7.3.11.5.
12/17	M175B01-03-17C	Changes in the following sections: 3.3. - 4.7. - 4.9. - 4.10.1. - 4.10.2.

SYMBOLS

Table 2: Symbols.

Symbol	Description
CE	In compliance with the relevant European directive.
	The device complies with the 2012/19/EC European directive. Do not dispose of the device in a household waste container at the end of its useful life. Observe the local electronic device recycling regulations.
⎓	Direct current.
~	Alternating current.

Note: *The images of the devices are for illustrative purposes only and might differ from the original device.*

1.- VERIFICATIONS UPON RECEPTION

The following must be checked upon reception of the device:

a) The device has been supplied according to the specifications in your order.
b) The device has not been damaged during transport.
c) Perform an external visual inspection of the device before connecting it.
d) Check that it has been supplied with the following:

RECmax-CVM 2-pole:

- An installation guide.
- 1 **MC1-75/0.25A** measuring transformer
- 1 **WGC-20SC** earth leakage transformer

RECmax-CVM 4-pole:

- An installation guide.
- 1 **MC3-75/0.25A** measuring transformer
- 1 **WGC-30SC** earth leakage transformer

	Immediately contact the carrier and/or **CIRCUTOR's** after-sales service if you detect any problem in the device upon reception.

2.- DESCRIPTION OF THE PRODUCT

RECmax-CVM is a protection device, with cut-off capacity, which features overcurrent protection, ultra-immunised earth leakage protection and a power analyzer.
The device is programmable and features a display. It measures the leakage current (earth leakage protection) and orders the disconnection and reclosing of the circuit breaker (protection) through a mechanically-operated motor.

There are 2 models available:

- ✓ **RECmax-CVM 2-pole**, for single-phase installations.
- ✓ **RECmax-CVM 4-pole**, for three-phase installations.

The device features:

- **Inputs** for the measurement of current and earth leakage current.
- **3 keys** that can be used to browse the various screens and program the device.
- **2 Indicator LEDs**.
- **LCD Display**, to view the parameters.
- **2 inputs** for remote control and locking.

- **2 alarm outputs**.
- **1 output** to indicate the status of the main switch.
- **1 digital output**.
- **RS-485** communications.

3.- INSTALLING THE DEVICE

3.1.- PRELIMINARY RECOMMENDATIONS

	The operators using and handling the device must follow the safety measures established in the country where the device will be used to guarantee its safe operation, using personal protective equipment if needed.

The **RECmax-CVM** device must be installed by authorised and qualified staff.

Disconnect the device from the mains and disconnect the measuring devices before handling, changing the connections of or replacing the device. Handling the device while it is connected is hazardous to people nearby.

The cables must be in perfect working order to prevent accidents or injuries to people and/or damage to the facilities/installations.

Limit the operation of the device to measuring the specified current or voltage values.

The manufacturer of the device shall not be held responsible for any damage resulting from the user or installation company failing to observe the warnings and/or recommendations indicated in this manual nor for any damage resulting from the use of non-original products or accessories or those from other brands.

Inspect the device before using it. Make sure that there are no cracks and that the housing is intact.

Do not use the device to take measurements if you detect an anomaly or malfunction.

Check the environment in which the device is installed before taking a measurement. Do not use the device to take measurements in dangerous, explosive, wet or damp environments.

	Disconnect the device from the mains and from the power supply (both the device and its measuring system) before performing any maintenance work, repairs or handling any of the connections of the device. Contact the after-sales service if you detect that the device is not working properly.

3.2.- INSTALLATION

	While the device is connected, the terminals, opening the cover or removing elements can expose parts that are hazardous to the touch. The device must not be used until the installation process is complete.

The **RECmax-CVM** must be installed inside an electric panel or enclosure and mounted on a DIN rail 46277 (EN 50022).

The device has connection indicator LEDs, indicating the presence of voltage. Even if these LEDs are not on, the user must still verify that the device is disconnected from all power supplies.

3.2.1.- MEASUREMENT OF THE EARTH LEAKAGE CURRENT IΔ

The earth leakage current must be measured using the **WGC** earth leakage transformer included with the device.
The **WGC** transformer, supplied with a cable and 2-pole connector**,** must be connected to terminals 1 and 2 of the device (see **Table 3**)

It is recommended to place the earth leakage transformer at the bottom of the circuit breaker (**Figure 6** and **Figure 7**).

	The external earth leakage transformer is necessary for the device to operate correctly. Even if its installation only appears linked to the correct working of the earth leakage protection, failing to install it will affect other functions of the device, such as the reclosing and display of parameters on the **RECmax-CVM** display.

	An incorrect or faulty connection of the earth leakage transformer means loss of the earth leakage protection and possible risk of electric shock.

In case of a faulty connection of the earth leakage transformer or if this transformer is not compatible with the **RECmax-CVM,** the screen shown in **Figure 1** will appear.

Figure 1: Error in the connection of the earth leakage transformer.

3.2.2.- MEASUREMENT OF THE PHASE CURRENT

The phase current must be measured using the **MC1-75/0.25A** (**RECmax-CVM 2-pole**) or **MC3-75/0.25A** current transformer (**RECmax-CVM 4-pole**) supplied with the device.

The **MC** transformer, supplied with a cable and 4-pole connector, must be connected to terminals 19, 20, 21 and 22 of the device (see **Table 3**)

⚠	The current measurement transformer must be installed on the top of the circuit breaker.

3.2.3.- SAFETY SEAL

The device features a seal on the neutral terminal, see **Figure 2**.

Figure 2: Safety seal on the neutral terminal.

This seal fulfils two functions:

✓ **Safety**, only the neutral cable must be installed in the sealed terminal.
For this, remove the central part from the seal to the point indicated, leaving the terminal free to be able to install the neutral cable, see **Figure 3**.

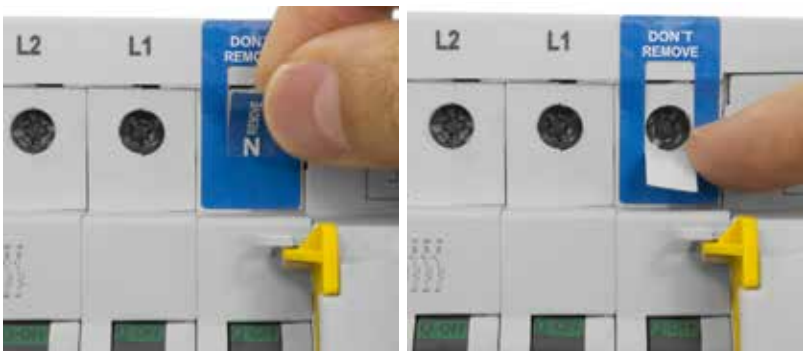


Figure 3: Remove the central part of the seal.

⚠	Wiring any cable that is not **Neutral** to this terminal may seriously damage the device, leaving it non-operational.

✓ **Warranty**, Once the central part of the seal has been removed, the side section of the seal must remain attached. **DO NOT REMOVE** this part, it ensures that the insulated busbar at the top of the circuit breaker has not been removed or tampered with.

⚠	**The warranty of the device will be void** if the safety seal has been tampered with or removed.

3.3.- TERMINALS OF THE DEVICE

The **RECmax-CVM** terminals are distributed between the upper and lower face of the device.

Table 3:List of RECmax-CVM terminals.

Terminals of the RECmax-CVM device	
1: Earth leakage current input IΔ	**13: REC LOCKED**, REC LOCKED Locking Alarm Output (NO)
2: Earth leakage current input IΔ	**14:** POSITIVE SAVE OUTPUT and REC LOCKED common output
3: S, RS-485 Communications	**15: POSITIVE SAVE OUTPUT**, POSITIVE SAVE OUTPUT Alarm Output (NO)
4: B-, RS-485 Communications	**16: BREAKER ON/OFF**, BREAKER ON/OFF Output (Common)
5: A+, RS-485 Communications	**17: BREAKER ON/OFF**, BREAKER ON/OFF Output (NO)
7: S0-, Digital Output	**18: BREAKER ON/OFF**, BREAKER ON/OFF Output (NC)
8: S0+, Digital Output	**19: 1S1**, Current input L1
9: EXT. ON/OFF, EXT ON/OFF Control Input (NO)	**20: 2S1**, Current input L2 (**RECmax-CVM** 4-pole model)
10: EXT LOCKED and EXT ON/OFF common output	**21: 3S1**, L3 current input (**RECmax-CVM** 4-pole model)
11: EXT LOCKED, EXT LOCKED locking input (NO)	**22: C**, Common connector for current measurement

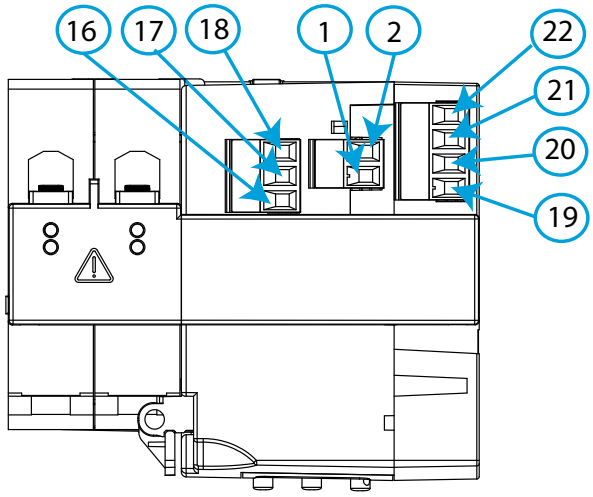


Figure 4:RECmax-CVM terminals, upper face.

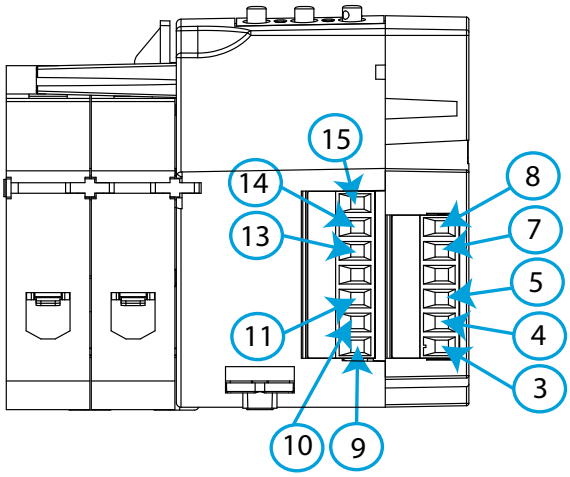


Figure 5:RECmax-CVM terminals, lower face.

3.4.- CONNECTION DIAGRAMS

3.4.1.- MEASUREMENT OF SINGLE-PHASE NETWORK: RECmax-CVM 2-POLE

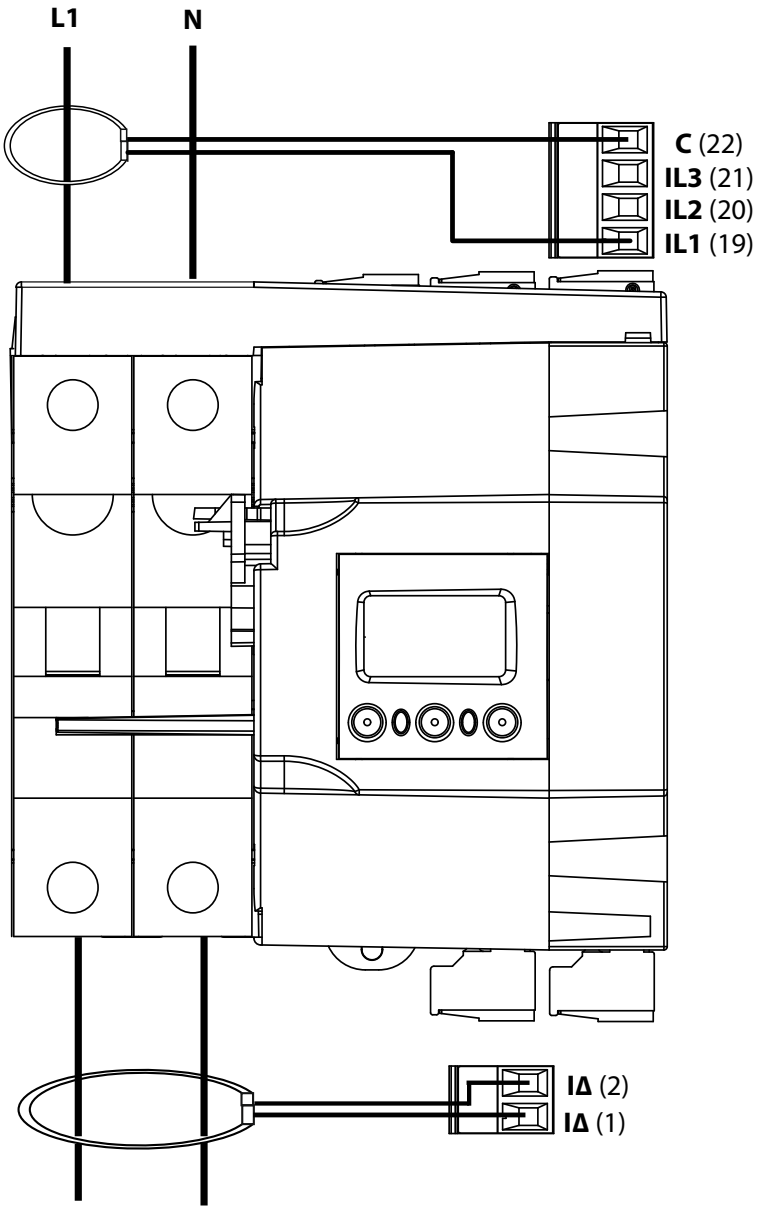


Figure 6: Measurement of single-phase network: RECmax-CVM 2-pole.

	All active conductors that feed the load to be protected, including the neutral, must pass through the internal diameter of the earth leakage transformer. Do not pass the protective conductor or the earth wire.
	The current measurement transformer must be installed at the top of the circuit breaker.

3.4.2.- MEASUREMENT OF THREE-PHASE NETWORK: RECmax-CVM 4-POLE

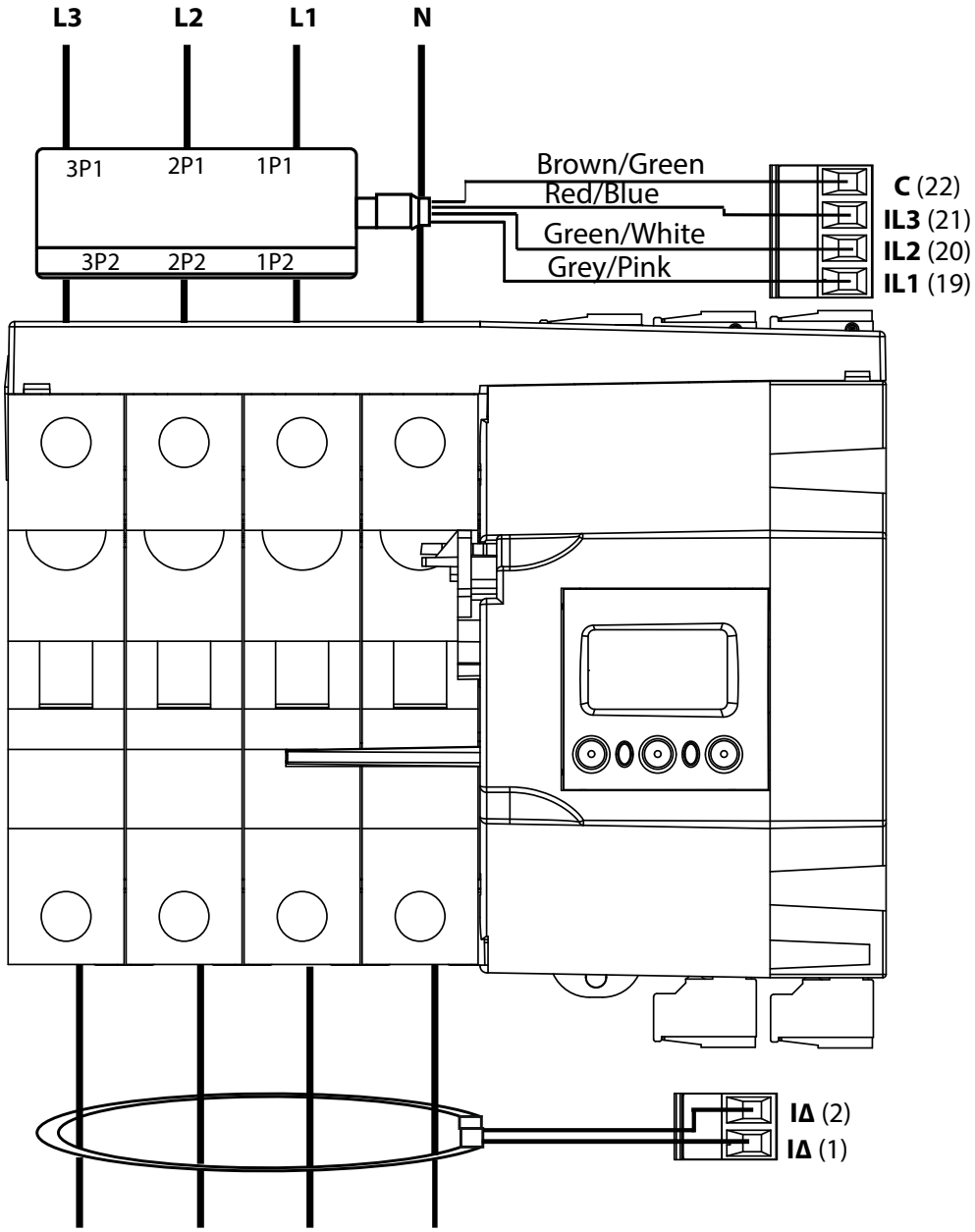


Figure 7: Measurement of three-phase network: RECmax-CVM 4-poles.

	All active conductors that feed the load to be protected, including the neutral, must pass through the internal diameter of the earth leakage transformer. Do not pass the protective conductor or the earth wire.
	The current measurement transformer must be installed on the top of the circuit breaker.

3.5.- DISCONNECTION OF THE DEVICE

If after wiring the **RECmax-CVM** you decide to have the protected line disconnected, you must disconnect the device manually by pushing the contact lever of the switch downwards and moving the mechanical lock (yellow sealable catch **Figure 8**) upwards. This eliminates any possibility of accidental reclosing

Figure 8: Mechanical lock.

	**Never** manually lower the circuit breaker without previously enabling the mechanical lock (moving the yellow sealable catch, **Figure 8,** upwards). This prevents accidental reclosing while handling the installation. When doing this the device is still powered so precautions must be taken to avoid touching live parts.

4.- OPERATION

4.1.- OPERATING PRINCIPLE

RECmax-CVM is a device for protecting single-phase or three-phase electrical installations of up to 63 A in which a high continuity of electrical service must be guaranteed.
The device has an automatic reset system after a trip, so it reconnects on its own after a period of time, with the installation recovering power without human operator intervention.

The basic functions of the **RECmax-CVM** are:

✓ Earth leakage protection (protecting people against electric shock and property against the risk of fire)

✓Protection against overloads and short-circuits with a circuit breaker.

✓Measurement and display of electrical parameters, see **Table 4**.

Table 4: Measurement parameters of the RECmax-CVM.

Parameter	Units	Phases L1-L2-L3	Total III	N
Phase-neutral voltage (1)	Vph-N	✓		
Phase-phase voltage	Vph-ph	✓		
Current(1)	A	✓		✓
Frequency	Hz	✓		
Active power (1)	M/kW	✓	✓	
Apparent Power	M/kVA	✓	✓	
Inductive Reactive Power	M/kvarL	✓	✓	
Capacitive Reactive Power	M/kvarC	✓	✓	
Power factor	PF	✓	✓	
Cos φ (1)	φ	✓	✓	
Voltage THD %	% THD V	✓		
Current THD %	% THD A	✓		
Harmonic Breakdown - Voltage (up to the 31st harmonic)	harm V	✓		
Harmonic Breakdown - Current (up to the 31st harmonic)	harm V	✓		
Total Active Energy	M/kWh		✓	
Total Inductive Reactive Energy	M/kvarLh		✓	
Total Capacitive Reactive Energy	M/kvarCh		✓	
Total Apparent Energy	M/kVAh		✓	
Active Energy generated	M/kWh		✓	
Inductive Reactive Energy generated	M/kvarLh		✓	
Capacitive Reactive Energy generated	M/kvarCh		✓	
Apparent energy generated	M/kVAh		✓	
Maximum Current Demand	A	✓	✓	
Maximum Active Power Demand	M/kW		✓	

Table 4 (Cont.): Measurement parameters of the RECmax-CVM.

Parameter	Units	Phases L1-L2-L3	Total III	N
Maximum Apparent Power Demand	M/kVA		✓	

(1) Parameters displayed.

4.2.- DESCRIPTION OF THE DEVICE

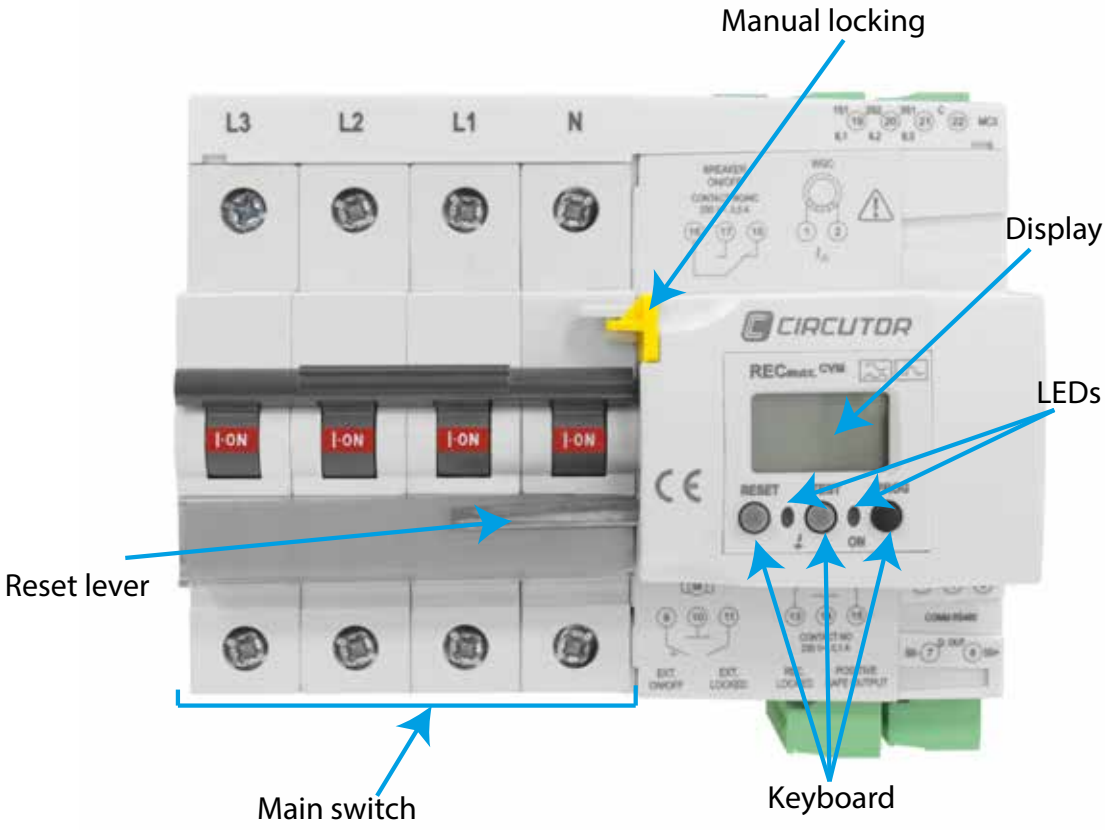


Figure 9: General description of the device.

4.3.- KEYBOARD FUNCTIONS

The **RECmax-CVM** has 3 keys, **Figure 10**:

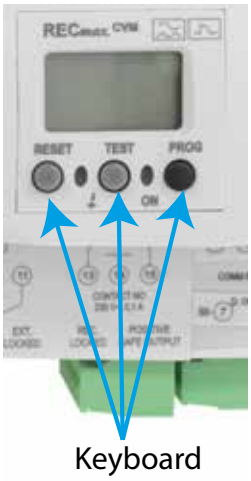


Figure 10: Keyboard.

✓ **TEST**, pressing this key causes a forced trip of the earth leakage protection. If the device has already tripped, pressing does not cause any action.

⚠	Pressing the **TEST** key disables the automatic reclosing system, as it is considered that the person who performs the local TEST will generate the reset for rearming the protection.

✓ **RESET**, the function of the key depends on the status of the device:

Table 5: Operation of the RESET key.

Key	Operation
RESET	**Normal operating status**
	Display of the home screen of the device with description of the firmware model and version.
	Trip status
	System restart and reclosing the device.
	Configuration
	Browsing the setup menu. Jumping between the different Configuration options.

✓ **PROG**, the function of the key depends on how long it is pressed. The **PROG** key is physically sealable, see ***"6.3.1.- PHYSICAL LOCKING".***

Table 6: Operation of the PROG key.

Key	Operation
PROG	**Short press (< 3 s)**
	Saves the configured values and exits the setup menu.
	Long press (> 3 s)
	Accesses the setup menu

4.4.- DISPLAY

The device has a backlight display with green or red light, according to the status of the device. The backlight is green and in trip conditions it is red under normal operating conditions.

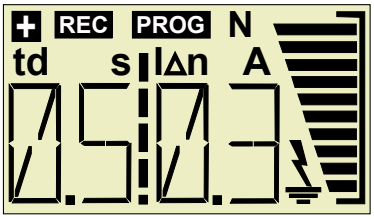


Figure 11: RECmax-CVM display.

The device display shows different symbols that indicate the operating status of the device:

The **leakage symbol** with the bars is activated when a leakage current is detected. The number of bars is proportional to the instantaneous value of the leakage current, scaled with respect to the trip current IΔn.

REC The **REC** symbol is displayed when automatic reclosing is possible.

The **+** symbol indicates that the **REC LOCKED locking alarm** is configured for positive safety.

PROG The **PROG** symbol is displayed on the setup screens of the device.

4.5.- LED INDICATORS

The device has 2 indicator LEDs, **Figure 12**.

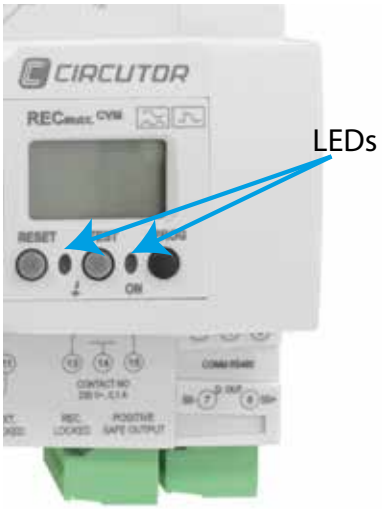


Figure 12: RECmax-CVM LED indicators.

Table 7: Description of the LEDs: Normal operating status.

Normal operating status	
LED	**Description**
Green	**On:** Powered device.
Red	**Off**

Table 8: Description of the LEDs: Trip status.

Trip status	
LED	**Description**
Green	**Off**
Red	**Flashing:** The device is waiting for the time needed for an automatic reclosing attempt. **Permanent:** Automatic reclosing is not possible.

⚠	The flashing or simultaneous switching on of the **Red** and **Green** LEDs indicates that the device is not working correctly, either because of an intrinsic problem in the device or due to improper installation.

Note: *One of the most frequent causes of improper installation is that the earth leakage transformer has not been connected. In that case the* ***Red*** *LED comes on and the* ***Green*** *LED flashes rapidly.*

4.6.- INPUTS

The **RECmax-CVM** has two keys:

✓ **EXT ON/OFF input** (terminals 9 and 10 in **Table 3**) enables the remote control of the main switch, trip or reset of the switch depending on its status.

✓ **EXT LOCKED locking input** (terminals 10 and 11 in **Table 3**) allows you to disable the reset.

Table 9: Inputs.

Inputs	Type	Activation mode
EXT ON/OFF	Voltage-free	200 ms pulses
EXT LOCKED	Voltage-free	By level

4.7.- OUTPUTS

The **RECmax-CVM** has four outputs:

✓ **REC LOCKED locking alarm** (terminals 13 and 14 in **Table 3**) indicates that the device is locked, i.e. that it cannot be automatically reclosed and needs a manual or external reset to recover its normal operation.

Table 10: REC LOCKED locking alarm.

Automatic reclosing	REC LOCKED locking alarm
	Contact 9 - 10
✓	Open
X	Closed

***Note:** The **REC LOCKED locking alarm** has the **Positive safety** Configuration; loss of power is treated as an alarm. This type of operation can be configured, see **"6.2.4.- POLT: CONFIGURATION OF THE** REC LOCKED ***OUTPUT"**.*

If configured ***without positive safety*** and the device loses power, the device may be locked and the **REC LOCKED** output won't be activated.

✓ **POSITIVE SAFE OUTPUT fault alarm** (terminals 14 and 15 in **Table 3**) indicates whether there is any power or not.

Table 11: POSITIVE SAFE OUTPUT fault alarm.

Power supply	POSITIVE SAFE OUTPUT fault alarm
	Contact 14 - 15
✓	Closed
X	Open

✓ **Digital output** (terminals 7 and 8 in **Table 3**) can work as an alarm for the measurement variables, to indicate that they are outside the programmed limits or to generate energy pulses, see "***7.3.11.5. Programming the Digital Output***"

✓ **BREAKER ON/OFF output** (terminals 16, 17 and 18 in **Table 3**) indicates status of the main switch.

Table 12: BREAKER ON/OFF output.

Main switch	BREAKER ON/OFF output	
	Contact 16 - 17	Contact 16 - 18
Closed	Closed	Open
Open	Open	Closed

4.8.- RESET LEVER AND MANUAL LOCKING

The device has a **reset lever (see Figure 9**), its default position is down. In case of reclosing, the motor lever is raised actuating the switch. After the reset, the motor lever returns to its downward position.

The device also has a **manual locking system** to prevent the possibility of automatic reclosing. The lever is sealable.

Reclosing of the device can be completely prevented through manual locking. The operation is performed by moving the **reset lever** downwards and moving **the manual locking system** (yellow catch) to the left.

In case of manual locking, the device is connected to the power supply. Therefore, there is a risk of electric shock if the power supply is not cut off.

4.9.- NORMAL OPERATING STATUS

In normal operating conditions, powered device and without tripping, the status of the device is shown in **Table 13.**

Table 13: Normal operating conditions.

Normal operating conditions			
Main switch	**Reset lever**	**Green LED**	**Red LED**
Closed (Lever up)	Down	Power on	Off
Display	**REC LOCKED Alarm**	**POSITIVE SAFE OUTPUT Alarm**	**BREAKER ON/OFF output**
Green	open contact	closed contact	contact 16-17: closed contact 16-18: open

4.10.- TRIP STATUS

The device may be tripped due to:

✓ **Actuation of the protection** due to an installation defect**,** whether the earth leakage protection or protection against overloads or a short-circuit.

✓ **Manual opening of the main switch,** lowering the switch lever.

✓ **Pressing** of the **TEST** key.

✓ **External order,** after the **EXT ON/OFF** remote control input.

	Whatever the case, if after the trip some maintenance check or action in the electrical installation is required, it is advisable to activate the **mechanical lock** to prevent accidental reclosing during operation.

	If the trip was caused by **actuation of the protection**, **NEVER** reclose the switch manually, always do so by pressing the **RESET** key.

The trip gives rise to one of 2 possibilities:

✓ **Automatic reclosing is possible**
✓ **Automatic reclosing is not possible**

4.10.1.- AUTOMATIC RECLOSING IS POSSIBLE

Immediately after the trip, the device begins a sequence of reclosing attempts with the programmed time intervals.
In this situation the status indicators are shown in **Table 14.**

Table 14: Trip status: Automatic reclosing possible.

Trip status: Automatic reclosing is possible			
Main switch	**Reset lever**	**Green LED**	**Red LED**
Open (Lever down)	Down	Off	Flashing
Display	**REC LOCKED Alarm**	**POSITIVE SAFE OUTPUT Alarm**	**BREAKER ON/OFF output**
Red	Open	Closed contact(1)	Contact 16-17: open Contact 16-18: closed

(1) If the power supply fails, the contact is open.

If the trip is caused by an earth leakage protection fault, the display will alternate between two screens indicating the trip current and number of reclosing attempts per earth leakage relay. (See **Figure 13** and ***"5.2.1.- EARTH LEAKAGE PROTECTION TRIP"***)

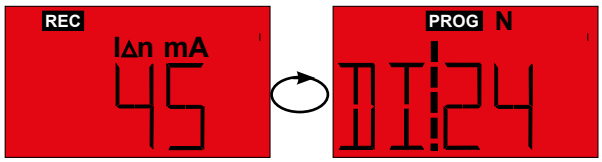


Figure 13: Screens after an earth leakage protection trip.

If the trip is caused by a fault in the protection due to overloads or a short circuit, a screen will appear indicating the number of reclosing attempts carried out by the circuit breaker. (See **Figure 14** and ***"5.2.2.- CIRCUIT BREAKER TRIP"***)

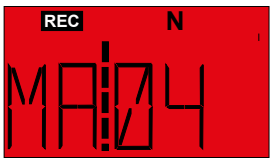


Figure 14: Screen after a circuit breaker trip.

	After an automatic reclosing sequence, the partial reclosing meters restart after 15 or 30 minutes after the last reclose, according to the value configured (see "***6.2.1.- SDR: EARTH LEAKAGE RECLOSING SEQUENCE"*** and ***"6.2.2.- SRM: CIRCUIT BREAKER RECLOSING SEQUENCE"***)

4.10.2.- AUTOMATIC RECLOSING IS NOT POSSIBLE

Automatic reclosing may not be possible for one of the following reasons:

1.- Reclosing has been disabled when programming the device. The display will show the cause of the trip without the **REC** symbol.
The reset is only possible by modifying the Configuration of the device, see ***"6.2.1.- SDR: EARTH LEAKAGE RECLOSING SEQUENCE"*** AND ***"6.2.2.- SRM: CIRCUIT BREAKER RECLOSING SEQUENCE"***

2.- The number of reclosing attempts has been exhausted. The display will show the cause of the trip without the **REC** symbol.
In this case, the reset is only possible by pressing the **RESET** key or by an external order of the **EXT ON/OFF** input.
Reclosing the device with the **RESET** key or the **EXT ON/OFF** input restarts the partial reclosing meters.

3.- The device was tripped manually by pressing the **TEST** key. The display will show the "**TEST**" text, see ***"5.2.3.- TRIPPING WITH THE TEST KEY"*.**
In this case, the reset is only possible by pressing the **TEST** key again.

4.- The trip was caused by the **EXT ON/OFF** remote control input. The display will show the "**EXT**" text, see ***"5.2.4.- TRIP DUE TO EXT ON/OFF INPUT"***
In this case, reclosing is only possible with another external order of the **EXT ON/OFF** remote control input.

5.- The **EXT LOCKED locking** is enabled. In this case, reclosing is only possible by deactivating that input.

In this situation the status indicators are shown in **Table 15.**

Table 15: Trip status: Automatic reclosing is not possible.

Trip status: Automatic reclosing is not possible			
Main switch	**Reset lever**	**Green LED**	**Red LED**
Open (Lever down)	Down	Off	Permanently on
Display	**REC LOCKED Alarm**	**POSITIVE SAFE OUTPUT Alarm**	**BREAKER ON/OFF output**
Red	Closed	Closed contact(1)	Contact 16-17: open Contact 16-18: closed

(1) If the power supply fails, the contact is open.

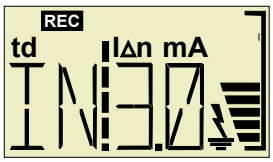
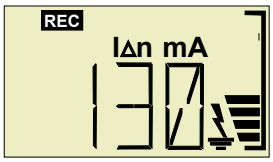
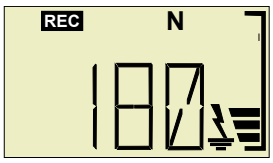
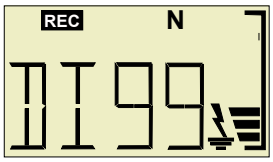
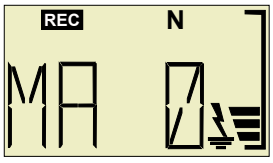
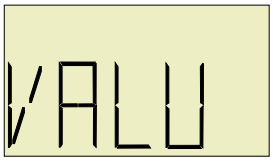
5.- DISPLAY

5.1.- NORMAL OPERATING STATUS

In the normal operating status, the device shows 5 information screens on the protection of the device and access to the electrical parameter display screens.

Press the **PROG** key to move between the different screens.

Table 16: Display screens: Normal operating status.

Display screens: Normal operating status.
 **Delay and Sensitivity**
 **Leakage current**
 **Total no. of trips**
 **No. of earth leakage protection trips** (1)
 **No. of trips due to protection against overloads and short circuits through a circuit breaker.** (1)
 **Access to the electrical parameters display screen.** Long press (> 3s) the **PROG** key to access the electrical parameters screen (**Figure 15**).

(1) Temporary screen, after 5 seconds of keyboard inactivity it jumps to the **Delay and Sensitivity** screen.

Figure 15 shows the electrical parameters display menu.

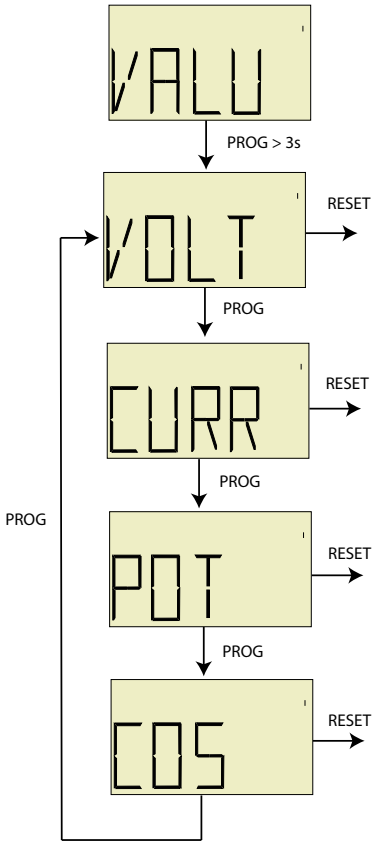


Figure 15: Electrical parameters display menu.

5.1.1.- VOLTAGE

The device measures and displays the voltage of each of the lines, L1, L2 and L3 (**Figure 16**).

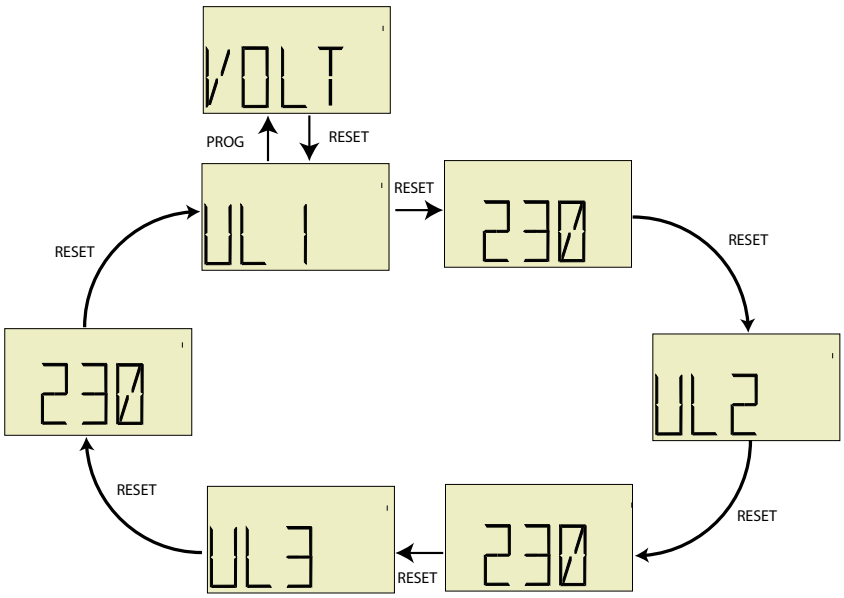


Figure 16: Voltage display menu.

5.1.2.- CURRENT

The device measures and displays the current of each of the lines, L1, L2 and L3 (**Figure 17**).

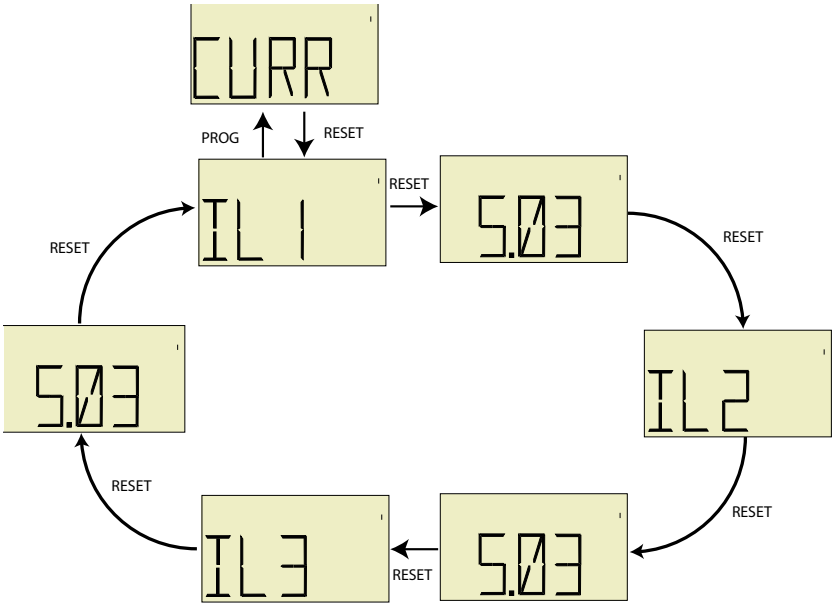


Figure 17: Current display menu.

5.1.3.- POWER

The device measures and displays the power of each of the lines, L1, L2 and L3 (**Figure 18**).

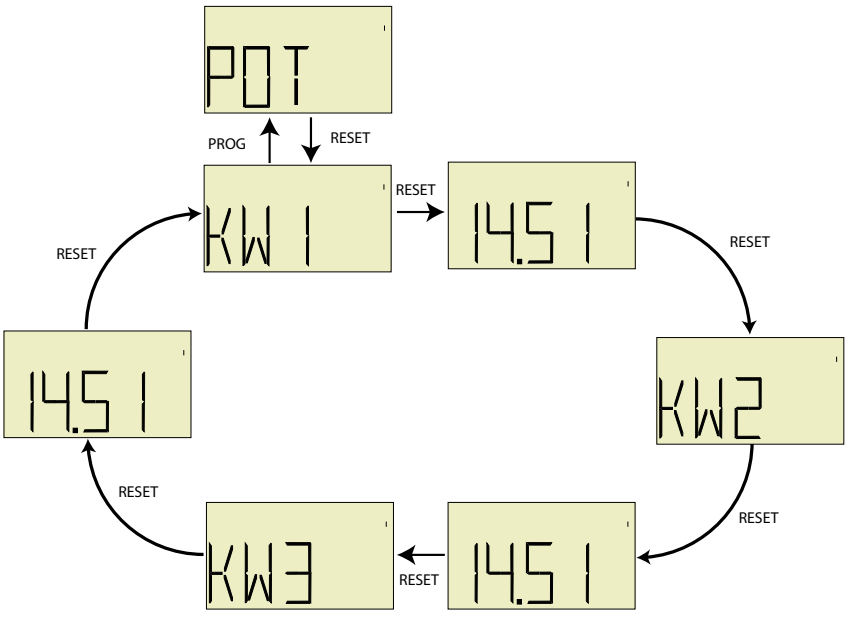


Figure 18: Power display menu.

5.1.4.- Cos φ

The device measures and displays the Cos φ of each of the lines, L1, L2 and L3 (**Figure 19**).

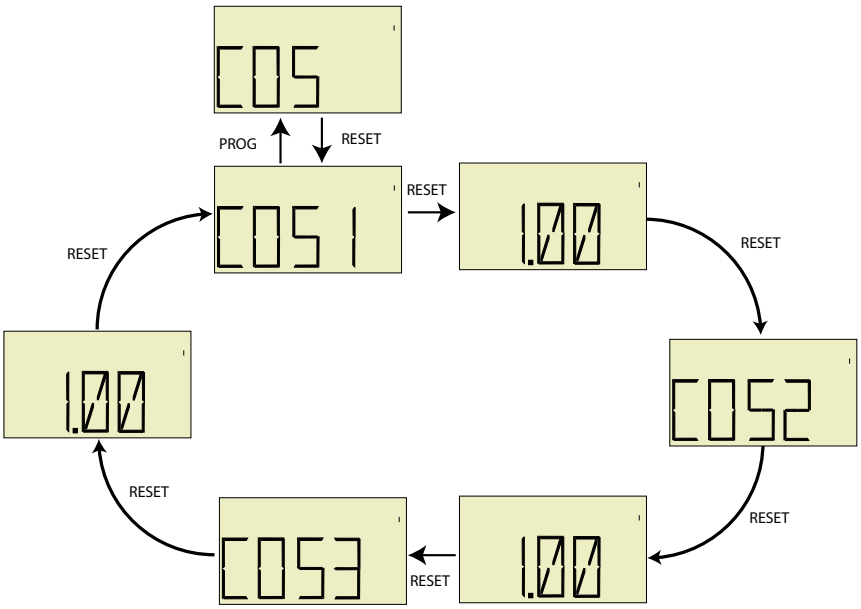


Figure 19: cos display menu.

5.2.- TRIP STATUS

When the trip occurs the device shows the display screens in red.

5.2.1.- EARTH LEAKAGE PROTECTION TRIP

Press the **PROG** key to move between the different screens.

Table 17: Display screens: Earth leakage protection trip.

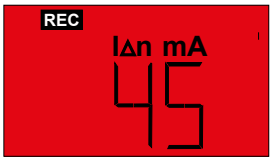
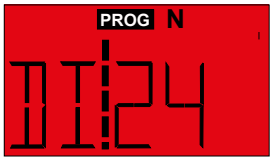
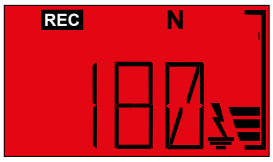
Display screens: Earth leakage protection trip
 **Delay and Sensitivity**
 Value of the **leakage current** which caused the trip. (1) ***Note:*** *If the current is out of range, the message* OVR appears.

Table 17 (Cont.): Display screens: Earth leakage protection trip.

Display screens: Earth leakage protection trip
 **No. of trips** which have occurred due to earth leakage protection. (1)
 **Total no. of trips**
 **Access to the electrical parameters display screen.** Long press (> 3s) the **PROG** key to access the electrical parameters screen (**Figure 15**).

(1) The leakage current and no. of trips screens are displayed alternately.

5.2.2.- CIRCUIT BREAKER TRIP

Press the **PROG** key to move between the different screens.

Table 18: Display screens: Circuit breaker trip.

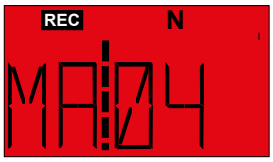
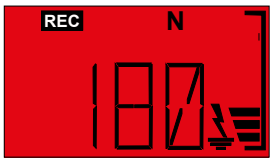
Display screens: Circuit breaker trip
 **Delay and Sensitivity**
 **No. of trips** which have occurred due to circuit breaker.
 **Total no. of trips**

Table 18 (Cont.): Display screens: Circuit breaker trip.

Display screens: Circuit breaker trip

Access to the electrical parameters display screen. Long press (> 3s) the **PROG** key to access the electrical parameters screens (**Figure 15**).

5.2.3.- TRIPPING WITH THE TEST KEY

When tripping the device by pressing the **TEST** key, the device will display the normal operating status screens, **Table 16**, but instead of displaying the **leakage current**, it will display the screen in **Figure 20.**

Figure 20: Trip due to TEST.

5.2.4.- TRIP DUE TO EXT ON/OFF INPUT

When tripping the device with the **EXT ON/OFF** input, the device will display the normal operating status screens, **Table 16**, but instead of displaying the **leakage current**, it will display the screen in **Figure 21.**

Figure 21: Trip due to EXT.

6.- CONFIGURATION

	The correct operation of the **RECmax-CVM** depends on its correct adjustment. Since it is a protection device, erroneous adjustment can compromise the protection of property and people. That is why it is very important that it is adjusted by a trained technician to decide on the most appropriate type of protection in each installation. **CIRCUTOR** accepts no responsibility for incorrect working of the device due to erroneous adjustment

6.1.- EARTH LEAKAGE PROTECTION

To configure the earth leakage protection, press the **PROG** key for more than 3 seconds, while the **Delay and Sensitivity** screen is displayed, **Figure 22**.

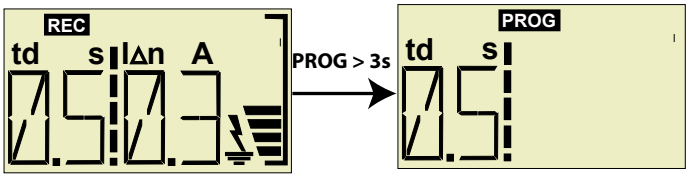
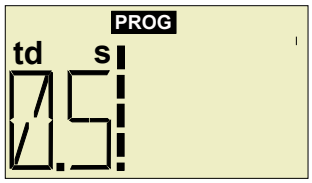


Figure 22: Configuration: Earth leakage protection.

6.1.1.- ACTIVATION DELAY

Configure the activation delay value on this screen, **Δt(td)**.



Press the **RESET** key to modify the value. The possible values are:

INS, reverse curve according to the leakage current intensity measured, **IΔ**, with instantaneous programming. **Table 19** shows the activation times.

SEL, reverse curve according to the leakage current intensity measured, **IΔ**, with selective programming. **Table 19** shows the activation times.

0.1s, 0.2s, 0.3s, 0.4s, 0.5s, 0.6s, 0.8s, 1s, fixed values.

Table 19: Activation times of the reverse curve.

		Maximum operating time for IΔ			
Type	**IΔn**	**IΔ : 1 x IΔn**	**IΔ : 2 x IΔn**	**IΔ : 5 x IΔn**	**500 A**
INStantaneous	All the values	0.3 s	0.15 s	0.04 s	0.04 s
SELective	> 0.03 A	0.5 s	0.2 s	0.15 s	0.15 s

Note: *Standard values of the IEC 61008-1.*

When the value on the screen is the desired value, press the **PROG** key to jump to the next programming point.

If you do not press any key for 10 s, the screen shown in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

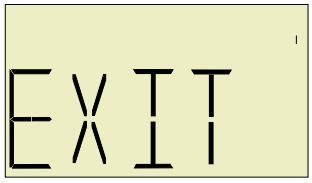
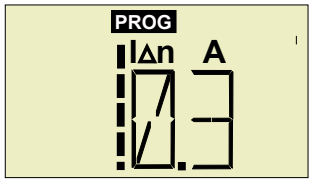


Figure 23: Screen indicating that the programming menu has been exited.

Default value: **INS**

6.1.2.- SENSITIVITY CURRENT, $I_{\Delta N}$

On this screen configure the current above which the earth leakage will be tripped, $I_{\Delta N}$.



Press the **RESET** key to modify the value. The possible values are:

30 mA, 0.1 A, 0.3 A, 0.5 A, 1A.

	Earth leakage protection for people must be adjusted to 30 mA and automatically means an instantaneous delay adjustment. Therefore, whenever $I_{\Delta N}$ is configured to 30 mA, the device will prevent any other adjustment of the delay.

Press the **PROG** key to save the modified values and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

Figure 24: Screen indicating that the data has been saved.

If no key is pressed for 10 s, the screen in **Figure 23** appears and the device exits the setup menu without saving the changes made.

Default value: **30 mA**

6.2.- AUTOMATIC RECLOSING

To configure the automatic reclosing parameters, press the **PROG** key for more than 3 seconds, while the **Leakage current** or **Total no. of trips** screen is displayed.

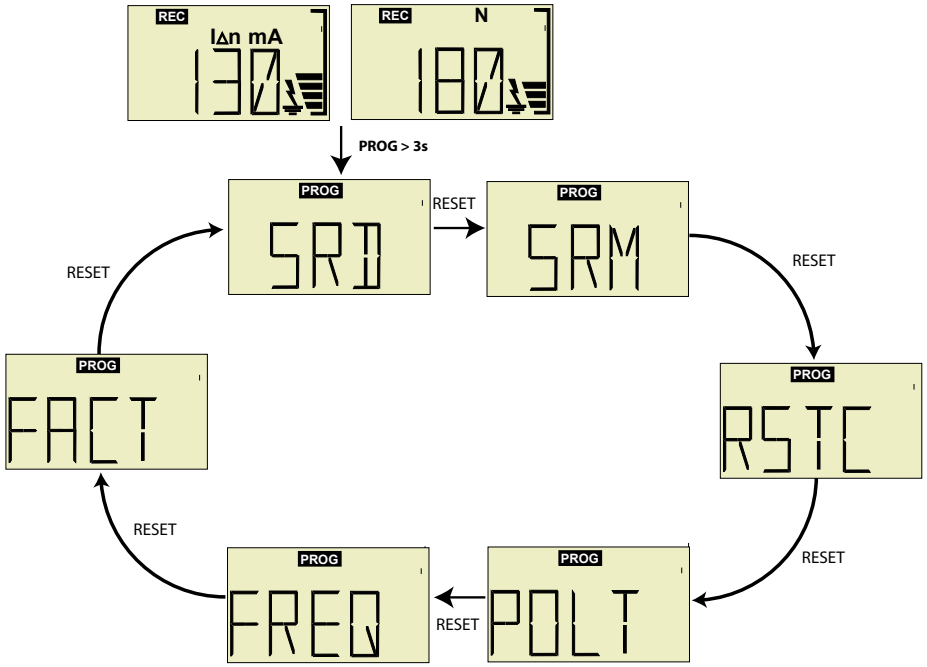
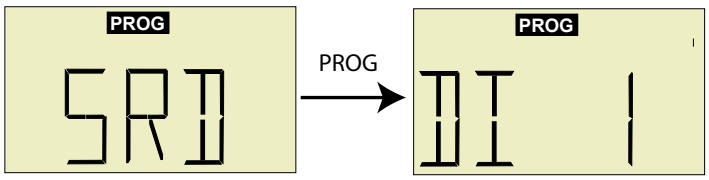


Figure 25: Configuration: Automatic reclosing.

6.2.1.- SRD: EARTH LEAKAGE RECLOSING SEQUENCE

The reclosing parameters are configured on this screen after an earth leakage protection trip.



Press the **RESET** key to move between the different sequences available (**DI**).
Each sequence determines the maximum no. of reclosing attempts (**NR**), the timer (**ST**) and the reset time of the partial meter (**TR**). **Table 20** shows the different sequences.

Table 20: Available sequences (SDR).

SDR: Available sequences			
DI	**NR**	**ST**	**TR**
DI 0	Automatic reclosing is disabled by earth leakage relay		
DI 1	6	8, 16, 30, 59, 115 and 224s	15 min.
DI 2	30	20s, 40s and 5 min. the rest	15 min.
DI 3	8	30s, 1, 2, 3, 4, 5, 6, and 7 min.	15 min.
DI 4	6	10, 20, 30, 60, 130 and 600s.	15 min.
DI 5	6	2, 4 and 8 min. the rest	15 min.
DI 6	7	30s, 1, 2, 3, 4, 8 and 16 min.	30 min.

Table 20 (Cont.): Available sequences (SDR).

SDR: Available sequences			
DI	**NR**	**ST**	**TR**
DI 7	10	1 min.	30 min.
DI 8	10	90 s.	30 min.
DI 9	8	2, 4 and 6 min. the rest	15 min.
DI 10	10	3 min.	30 min.
DI 11	7	2, 4, 8, 16 and 32 min. the rest	15 min.
DI 12	31	2, 4 and 6 min. the rest	60 min.
DI 13	3	2, 4 and 8 min.	15 min.
DI 14	Free space for personalising the customer.		

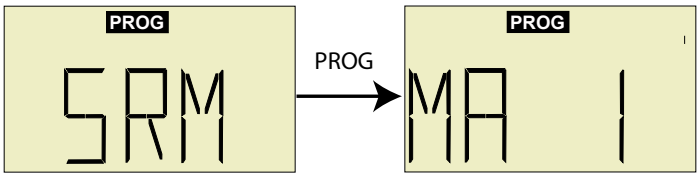
Press the **PROG** key to save the selected sequence and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

If you do not press any key for 10 s, the screen shown in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

Default value: **DI 10**

6.2.2.- SRM: CIRCUIT BREAKER RECLOSING SEQUENCE

The reclosing parameters are configured on this screen after a circuit breaker trip.



Press the **RESET** key to move between the different sequences available (**MA**).
Each sequence determines the maximum no. of reclosing attempts (**NR**), the timer (**ST**) and the reset time of the partial meter (**TR**). **Table 21** shows the different sequences.

Table 21: Available sequences (SRM).

SRM: Available sequences			
MA	**NR**	**ST**	**TR**
MA 0	Automatic reclosing is disabled by circuit breaker		
MA 1	2	1 min.	30 min.
MA 2	2	1 min.	60 min.
MA 3	2	90 s	30 min.
MA 4	2	90 s	60 min.
MA 5	2	3 min.	30 min.
MA 6	2	30 s	30 min.
MA 7	6	30 s	30 min.
MA 8	Free space for personalising the customer.		

Press the **PROG** key to save the selected sequence and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

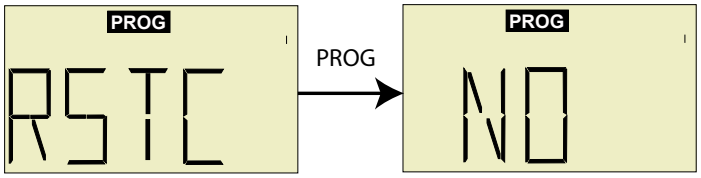
If you do not press any key for 10 s, the screen shown in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

	If **SRM** and **SRD** have been configured with the number 0 sequence, automatic reclosing will be fully disabled. The **REC** symbol disappears from the display.

Default value: **MA 5**

6.2.3.- RSTC: PARTIAL METER RESETTING

The partial reclosing meters are reset on this screen.



Press the **RESET** key to move between the different options:

NO, the meters are not reset.
YES, the meters are reset.

Press the **PROG** key to save the selected option and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

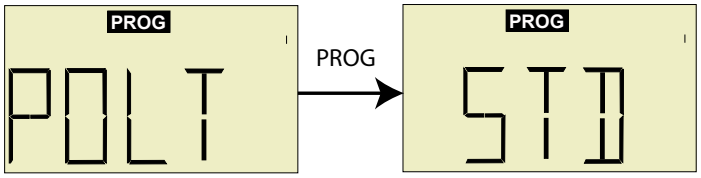
If you do not press any key for 10 s, the screen shown in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

	In this section only the partial meters are set to zero, i.e., those that separately accumulate the no. of recloses caused by a circuit breaker trip (MA) or by an earth leakage trip (DI). See ***"6.2.6.- FACT: FACTORY CONFIGURATION"*** to reset the total meter.

Default value**: NO**

6.2.4.- POLT: CONFIGURATION OF REC LOCKED OUTPUT

Configure the type of contact of the **REC LOCKED** output on this screen.



Press the **RESET** key to move between the different options:

STD, the contactor of the **REC LOCKED** output acts without positive safety.
POS, the contactor of the **REC LOCKED** output acts with positive safety.

Press the **PROG** key to save the selected option and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

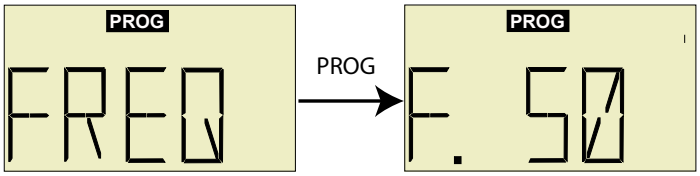
If you do not press any key for 10 s, the screen in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

Note: *If the positive safety of the contactor has been programmed, the + symbol will appear on the display.*

Default value: **POS**

6.2.5.- FREQ: NOMINAL FREQUENCY

Configure the nominal operating frequency of the device on this screen.



Press the **RESET** key to move between the different options:
F. 50, nominal frequency 50 Hz.
F. 60, nominal frequency 60 Hz.

Press the **PROG** key to save the selected option and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

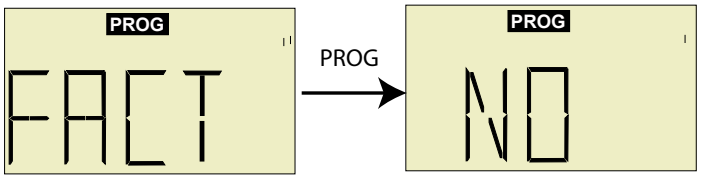
If you do not press any key for 10 s, the screen in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

	Configuring the frequency is essential for being able to correctly calculate and display the instantaneous value of the leakage currents and the trip current. Incorrect Configuration of the frequency causes unstable measurements with wild swings, so the earth leakage protection may not work correctly.

Default value: **F. 50**

6.2.6.- FACT: FACTORY CONFIGURATION

The factory default Configuration can be restored on this screen.



Press the **RESET** key to move between the different options:

NO, the factory values are not restored.
YES, the factory values are restored.

	Selecting the option **YES** means a **total reset**, which includes the control parameters for the protection trigger. Its use is therefore only advised when the downstream loads are out of service.

Press the **PROG** key to save the selected option and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

If you do not press any key for 10 s, the screen in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

Default value: **NO**

6.3.- LOCKING THE CONFIGURATION

After configuring the device, you can lock the Configuration of the parameters. There are two locking methods:

- ✓ Physical locking,
- ✓ Program locking,

6.3.1.- PHYSICAL LOCKING

The **PROG** key has a hole through which a sealing wire can be passed, so that it is physically impossible to press it.
With the physical locking option you cannot access all the display screens or the Configuration of the device.
This means that before locking the key, you must choose the fixed screen that will display the device.

6.3.2.- PROGRAM LOCKING

With the program locking option you can access all the display and Configuration screens but you cannot modify any data.

To lock the Configuration of the device, hold down the **PROG** and **RESET** keys at the same time for more than 3 seconds, and the screen in **Figure 17** will appear.

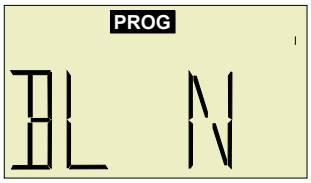


Figure 26: Locking screen

Press the **RESET** key to move between the different options:

BL N, removes the Configurations locking

BL Y, activates the Configuration locking.

Press the **PROG** key to save the selected option and exit the setup menu; when exiting, the screen in **Figure 24** is displayed for a few seconds.

If you do not press any key for 10 s, the screen in **Figure 23** appears and the device opens the **Delay and Sensitivity** screen, without saving the changes made.

Default value: **BL N**

7.- RS-485 COMMUNICATIONS

RECmax-CVM devices feature one RS-485 communications port. The device has uses the **MODBUS RTU** communications protocol as the standard protocol.

7.1.- CONNECTIONS

The RS-485 cable must be wired with twisted pair cable with mesh shield (minimum 3 wires), with a maximum distance between the **RECmax-CVM** and the master device of 1200 metres. Up to 32 **RECmax-CVM** devices can be connected to this bus.

Use an intelligent RS-232 to RS-485 network protocol converter to establish the communications with the master device.

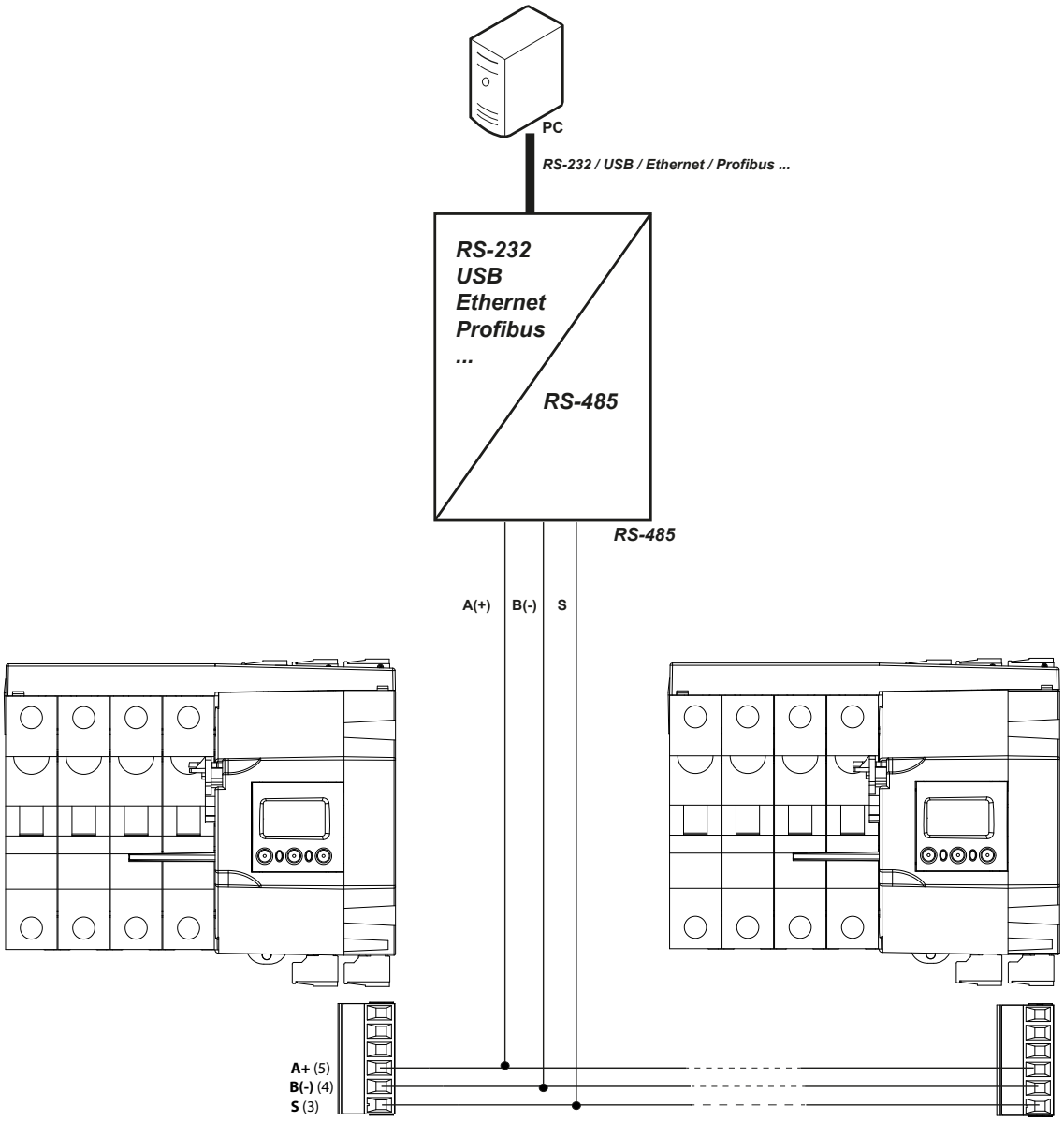


Figure 27: RS-485 Connection diagram.

7.2.- MODBUS PROTOCOL

In the Modbus protocol, the **RECmax-CVM** uses the RTU (Remote Terminal Unit) mode. The Modbus functions implemented in the device are as follows:

Functions 0x03 and 0x04. Reading integer registers.
Function 0x05. Writing a relay.
Function 0x10. Writing multiple registers.

7.2.1. READ EXAMPLE: Function 0x04.

Query: Instantaneous value of the L1 phase voltage

Address	Function	Initial Register	No. of registers	CRC
0 A	04	0000	0002	70B0

Address: 0A, Peripheral number: 10 in decimal.
Function: 04, Read function.
Initial Register: 0000, register from which to start reading.
No. of Registers: 0002, number of registers to be read.
CRC: 70B0, CRC character.

Response:

Address	Function	No. of Bytes	Register no. 1	Register No. 2	CRC
0 A	04	04	0000	084D	86B1

Address: 0A, Responding peripheral number: 10 in decimal.
Function: 04, Read function.
No. of bytes: 04, No. of bytes received.
Register: 0000084D, value of the L1 phase voltage: VL1 x 10 : 212.5V
CRC: 86B1, CRC character.

Note: *Every Modbus frame has a maximum limit of 20 variables (40 registers).*

7.2.2. WRITE EXAMPLE: Function 0x05.

Query: Deletion of maximum and minimum values.

Address	Function	Initial Register	Value	CRC
0 A	05	0834	FF00	CEEF

Address: 0A, Peripheral number: 10 in decimal.
Function: 05, Write function.
Initial Register: 0834, Register of deletion of maximum and minimum values parameter.
Value: FF00, We indicate that we want to delete the maximum and minimum values.
CRC: CEEF, CRC character.

Response:

Address	Function	Initial register	Value	CRC
0 A	05	0834	FF00	CEEF

7.3.- MODBUS COMMANDS

7.3.1. MEASUREMENT VARIABLES

All Modbus map addresses are expressed in hexadecimal.
The **Functions 0x03** and **0x04** are implemented for these variables.

Table 22: Modbus memory map (Table 1)

Parameter	Symbol	Instantaneous	Maximum	Minimum	Units
Phase voltage L1	V1	00-01	106-107	164-165	V x 10
Current L1	A1	02-03	108-109	166-167	mA
Active power L1	kW 1	04-05	10A-10B	168-169	W
Inductive Power L1	kvarL 1	06-07	10C-10D	16A-16B	var
Capacitive Power L1	kvarC 1	08-09	10E-10F	16C-16D	var
Apparent power L1	kVA 1	0A-0B	110-111	16E-16F	VA
Power factor L1	PF 1	0C -0D	112-113	170-171	x 100
L1 Cos φ	Cos φ 1	0E-0F	114-115	172-173	x 100
Phase voltage L2	V2	10-11	116-117	174-175	V x 10
Current L2	A2	12-13	118-119	176-177	mA
Active power L2	kW2	14-15	11A-11B	178-179	W
Inductive Power L2	kvarL 2	16-17	11C-11D	17A-17B	var
Capacitive Power L2	kvarC 2	18-19	11E-11F	17C-17D	var
Apparent Power L2	kVA 2	1A-1B	120-121	17E-17F	VA
Power Factor L2	PF 2	1C -1D	122-123	180-181	x 100
L2 Cos φ	Cos φ 2	1E-1F	124-125	182-183	x 100
Phase voltage L3	V 3	20-21	126-127	184-185	V x 10
Current L3	A 3	22-23	128-129	186-187	mA
Active power L3	kW 3	24-25	12A-12B	188-189	W
Inductive Power L3	kvarL 3	26-27	12C-12D	18A-18B	var
Capacitive Power L3	kvarC 3	28-29	12E-12F	18C-18D	var
Apparent Power L3	kVA 3	2A-2B	130-131	18E-18F	VA
Power Factor L3	PF 3	2C -2D	132-133	190-191	x 100
Cos φ L3	Cos φ 3	2E-2F	134-135	192-193	x 100
Three-phase active power	kW III	30-31	136-137	194-195	W
Three-phase inductive power	kvarL III	32-33	138-139	196-197	var
Three-phase capacitive power	kvarC III	34-35	13A-13B	198-199	var
Three-phase apparent power	kVA III	36-37	13C-13D	19A-19B	VA
Three-phase power factor	PF III	38-39	13E-13F	19C-19D	x100
Three-phase cos φ	Cos φ III	3A-3B	140-141	19E-19F	x100
Frequency L1	Hz	3C -3D	142-143	1A0-1A1	Hz x100
Voltage L1-L2	V12	3E-3F	144-145	1A2-1A3	V x 10
Voltage L2-L3	V23	40-41	146-147	1A4-1A5	V x 10

Table 22 (Cont.) : Modbus memory map (Table 1)

Parameter	Symbol	Instantaneous	Maximum	Minimum	Units
Voltage L3-L1	V31	42-43	148-149	1A6-1A7	V x 10
Neutral Current N	A N	44-45	14A-14B	1A8-1A9	mA
L1 voltage THD %	%THDV1	46-47	14C-14D	1AA-1AB	% x 10
L2 Voltage THD %	%THDV2	48-49	14E-14F	1AC-1AD	% x 10
L3 Voltage THD %	%THDV3	4A-4B	150-151	1AE-1AF	% x 10
L1 Current THD %	%THDI1	4C -4D	152-153	1B0-1B1	% x 10
L2 Current THD %	%THDI2	4E-4F	154-155	1B2-1B3	% x 10
L3 Current THD %	%THDI3	50-51	156-157	1B4-1B5	% x 10
Maximum demand kW III	Md(Pd)	52-53	158-159	-	W
Maximum demand kVA III	Md(Pd)	54-55	15A-15B	-	VA
Maximum demand I AVG	Md(Pd)	56-57	15C-15D	-	mA
Maximum demand I L1	Md(Pd)	58-59	15E-15F	-	mA
Maximum demand I L2	Md(Pd)	5A-5B	160-161	-	mA
Maximum demand I L3	Md(Pd)	5C -5D	162-163	-	mA

7.3.2. ENERGY VARIABLES

All Modbus map addresses are expressed in hexadecimal.
The **Functions 0x03** and **0x04** are implemented for these variables.

Table 23: Modbus memory map (Table 2)

Parameter	Symbol	Instantaneous	Units
Active energy (kW)	kWh III	5E-5F	kWh
Active energy (W)	kWh III	60-61	Wh
Inductive reactive energy (kvarhL)	kvarhL III	62-63	kvarh
Inductive reactive energy (varhL)	kvarhL III	64-65	varh
Capacitive reactive energy (kvarhC)	kvarhC III	66-67	kvarh
Capacitive reactive energy (varhC)	kvarhC III	68-69	varh
Apparent energy (kVah)	kVAh III	6A-6B	kVAh
Apparent energy (VAh)	kVAh III	6C -6D	VAh
Active energy generated (kW)	kWh III	72-73	kWh
Active energy generated (W)	kWh III	74-75	Wh
Inductive reactive energy generated (kvarhL)	kvarhL III	76-77	kvarh
Inductive reactive energy generated (varhL)	kvarhL III	78-79	varh
Capacitive reactive energy generated (kvarhC)	kvarhC III	7A-7B	kvarh
Capacitive reactive energy generated (varhC)	kvarhC III	7C-7D	varh
Apparent energy generated (kVAh)	kVAh III	7E-7F	kVAh
Apparent energy generated (VAh)	kVAh III	80-81	VAh

7.3.3. VOLTAGE AND CURRENT HARMONICS.

All Modbus map addresses are expressed in hexadecimal.
The **Functions 0x03** and **0x04** are implemented for these variables.

Table 24:Modbus memory map (Table 3).

Parameter	Voltage L1	Voltage L2	Voltage L3	Units
Fundamental Harm.	A28-A29	A48-A49	A68-A69	V x 10
2nd harmonic	A2A	A4A	A6A	% x 10
3rd harmonic	A2B	A4B	A6B	% x 10
4th harmonic	A2C	A4C	A6C	% x 10
5th harmonic	A2D	A4D	A6D	% x 10
6th harmonic	A2E	A4E	A6E	% x 10
7th harmonic	A2F	A4F	A6F	% x 10
8th harmonic	A30	A50	A70	% x 10
9th harmonic	A31	A51	A71	% x 10
10th harmonic	A32	A52	A72	% x 10
11th harmonic	A33	A53	A73	% x 10
12th harmonic	A34	A54	A74	% x 10
13th harmonic	A35	A55	A75	% x 10
14th harmonic	A36	A56	A76	% x 10
15th harmonic	A37	A57	A77	% x 10
16th harmonic	A38	A58	A78	% x 10
17th harmonic	A39	A59	A79	% x 10
18th harmonic	A3A	A5A	A7A	% x 10
19th harmonic	A3B	A5B	A7B	% x 10
20th harmonic	A3C	A5C	A7C	% x 10
21st harmonic	A3D	A5D	A7D	% x 10
22nd harmonic	A3E	A5E	A7E	% x 10
23rd harmonic	A3F	A5F	A7F	% x 10
24th harmonic	A40	A60	A80	% x 10
25th harmonic	A41	A61	A81	% x 10
26th harmonic	A42	A62	A82	% x 10
27th harmonic	A43	A63	A83	% x 10
28th harmonic	A44	A64	A84	% x 10
29th harmonic	A45	A65	A85	% x 10
30th harmonic	A46	A66	A86	% x 10
31st harmonic	A47	A67	A87	% x 10

Table 25:Modbus memory map (Table 4).

Parameter	Current L1	Current L2	Current L3	Units
Fundamental Harm.	A88-A89	AA8-AA9	AC8-AC9	mA x 10
2nd harmonic	A8A	AAA	ACA	% x 10
3rd harmonic	A8B	AAB	ACB	% x 10
4th harmonic	A8C	AAC	ACC	% x 10
5th harmonic	A8D	AAD	ACD	% x 10
6th harmonic	A8E	AAE	ACE	% x 10
7th harmonic	A8F	AAF	ACF	% x 10

Table 25 (Cont.): Modbus memory map (Table 4).

Parameter	Current L1	Current L2	Current L3	Units
8th harmonic	A90	AB0	AD0	% x 10
9th harmonic	A91	AB1	AD1	% x 10
10th harmonic	A92	AB2	AD2	% x 10
11th harmonic	A93	AB3	AD3	% x 10
12th harmonic	A94	AB4	AD4	% x 10
13th harmonic	A95	AB5	AD5	% x 10
14th harmonic	A96	AB6	AD6	% x 10
15th harmonic	A97	AB7	AD7	% x 10
16th harmonic	A98	AB8	AD8	% x 10
17th harmonic	A99	AB9	AD9	% x 10
18th harmonic	A9A	ABA	ADA	% x 10
19th harmonic	A9B	ABB	ADB	% x 10
20th harmonic	A9C	ABC	ADC	% x 10
21st harmonic	A9D	ABD	ADD	% x 10
22nd harmonic	A9E	ABE	ADE	% x 10
23rd harmonic	A9F	ABF	ADF	% x 10
24th harmonic	AA0	AC0	AE0	% x 10
25th harmonic	AA1	AC1	AE1	% x 10
26th harmonic	AA2	AC2	AE2	% x 10
27th harmonic	AA3	AC3	AE3	% x 10
28th harmonic	AA4	AC4	AE4	% x 10
29th harmonic	AA5	AC5	AE4	% x 10
30th harmonic	AA6	AC6	AE6	% x 10
31st harmonic	AA7	AC7	AE7	% x 10

7.3.4. PROTECTION VARIABLES

All Modbus map addresses are expressed in hexadecimal.
The **Functions 0x03** and **0x04** are implemented for these variables.

Table 26:Modbus memory map: Protection variables

Parameters	Address	Units
Leakage current	C397	mA
Trip current	C398	mA
Network voltage	C399	V
Total no. of reclosing operations	C392	-
No. of reclosing operations due to earth leakage protection trip.	C393	-
No. of reclosing operations due to circuit breaker trip	C394	-
Total no. of reclosing operations due to earth leakage protection trip.	C395	-
Total no. of reclosing operations due to circuit breaker trip	C396	-

7.3.5. DELETING PARAMETERS.

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x05** is implemented for these variables.

Table 27:Modbus memory map: Deleting parameters.

Parameters	Address	Valid data margin
Deleting energy values	834	**FF00**
Deleting maximum and minimum values	838	**FF00**
Start of maximum demand	839	**FF00**
Deleting the maximum value of maximum demand	83F	**FF00**
Deleting energies, maximum demand and maximums and minimums	848	**FF00**

7.3.6. FUNCTION OF THE POSITIVE SAVE OUTPUT RELAY.

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x04** is implemented for these variables.
In these parameters select the function that the **POSITIVE SAVE OUTPUT** relay will perform.

Table 28:Modbus memory map: Status of the AUX relay.

Parameters	Address	Valid data margin
Function of the relay POSITIVE SAVE OUTPUT	C363	**0:** Power supply error **1:** Status of main switch **2:** Indicates a value of 50% of earth leakage **3:** Indicates a value of 60% of earth leakage **4:** Indicates a value of 70% of earth leakage **5:** Indicates a value of 80% of earth leakage **6:** Indicates a value of 85% of earth leakage

7.3.7. STATUS OF THE INPUTS

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x04** is implemented for these variables.

Table 29:Modbus memory map: Status of the inputs.

Parameters	Address	Valid data margin
Status of the inputs	C38F	-

The format of the variable is shown in **Table 30.**

Table 30:Format of the variable: Power status.

Bit	
1	**1:** Status of main switch OFF
2	**1: EXT ON/OFF** input
3	**1: EXT LOCKED** input
4	**1:** Earth leakage transformer error
5	**1: RESET** key activated
6	**1: TEST** key activated
7	**1: PROG** key activated
8	**1:** Manual locking deactivated
9	**EXT LOCKED** input activated

7.3.8. STATUS OF THE RELAY OUTPUTS

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x04** is implemented for these variables.

Table 31:Modbus memory map: Status of the outputs.

Parameters	Address	Valid data margin
Status of the outputs	C390	-

The format of the variable is shown in **Table 32.**

Table 32:Format of the variable: Power status.

Bit	
0	**1: REC LOCKED** relay ON
1	**1: POSITIVE SAFE OUTPUT** relay ON

7.3.9. DIGITAL OUTPUT STATUS

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x04** is implemented for these variables.

Table 33:Modbus memory map: Digital output status.

Parameters	Address	Valid data margin
Digital output status	4E21	**0x00:** Digital output OFF **0x04:** Digital output ON

7.3.10. DEVICE INFORMATION.

All Modbus map addresses are expressed in hexadecimal.
The **Function 0x04** is implemented for this variable.

Table 34:Modbus memory map: Device information

Device information	
Variable	**Address**
Model	C374
Submodel	C375 - C376
Firmware version	C38C
Software version	05DC - 05DD
Serial number	578 - 579

7.3.11. DEVICE CONFIGURATION VARIABLES.

All Modbus map addresses are expressed in hexadecimal.

The Modbus function of the device does not check whether the variables recorded are within the correct margins or not; they are only checked when reading them from EEPROM. If any parameter is recorded with an incorrect value, the device will be configured with its default value.

The Modbus Configuration will not take effect until the device is reset.

7.3.11.1. Transformation ratios.

The **Function 0x04** is implemented for these variables.

Table 35:Modbus memory map: Transformation ratios.

Transformation ratios	
Configuration variable	**Address**
Voltage primary	2710 - 2711
Voltage secondary	2712
Current primary	2713
Current secondary	2714

7.3.11.2. Number of quadrants

The **Function 0x04** is implemented for these variables.

Table 36:Modbus memory map: Number of quadrants

Number of quadrants		
Configuration variable	**Address**	**Valid data margin**
Number of quadrants	277C	**0:** 4 quadrants **1:** 2 quadrants

7.3.11.3. Maximum demand

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 37:Modbus memory map: Maximum demand

Maximum demand			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Integration period	274C	**1 - 60** minutes	15
Type of integration	274D	**0:** sliding **1:** 2 fixed	0

7.3.11.4. Configuration of the THD

The **Functions 0x04** and **0x10** are implemented for this variable.
In this parameter, select the type of calculation of the THD.

Table 38:Modbus memory map: THD Configuration

THD Configuration			
Configuration variable	**Address**	**Valid data margin**	**Default value**
THD calculation	2774	**0:** RMS **1:** fundamental	0

7.3.11.5. Programming the Digital Output

The **Functions 0x04** and **0x10** implemented for this variable.
You can configure the operation of the Digital Output with these parameters (terminals 7 and 8 in **Table 3**)

Table 39:Modbus memory map: Programming the Digital Output.

Programming the digital output			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Maximum value or energy pulse	2B0C-2B0D	according to variable	0
Minimum value	2B0E-2B0F	according to variable	0
Variable code	2B10	**Table 40, Table 41** and **Table 42**	0
Connection delay (1)	2B11	**0 - 9999** seconds	0
Pulse width (1)	2B11	**0 - 9999** ms	0
Hysteresis	2B12	**0 - 99** %	0
Interlocking (latch)	2B13	**0 :** No **1:** Yes	0
Disconnection delay	2B14	**0 - 9999** seconds	0
Status of the contacts	2B15	**0 :** Normally open **1:** Normally closed	0

(1) The **Connection delay** or **Pulse width** variables are in the same direction and depend on whether an alarm or energy pulse has been configured or not.

Table 40: Code of the parameters for programming the measurement alarm.

Parameter	Phase	Code	Phase	Code	Phase	Code	Phase	Code
Phase-Neutral Voltage	L1	01	L2	09	L3	17	-	-
Current	L1	02	L2	10	L3	18	-	-
Active Power	L1	03	L2	11	L3	19	III	25
Inductive Reactive Power	L1	04	L2	12	L3	20	III	26
Capacitive Reactive Power	L1	05	L2	13	L3	21	III	27
Apparent Power	L1	06	L2	14	L3	22	III	28
Power factor	L1	07	L2	15	L3	23	III	29
Cosine φ	L1	08	L2	16	L3	24	III	30
% THD V	L1	36	L2	37	L3	38	-	-
% THD A	L1	39	L2	40	L3	41	-	-
Phase-Phase Voltage	L1/2	32	L2/3	33	L3/1	34	-	-
Frequency	-	31	-	-	-	-	-	-
Neutral current	-	35	-	-	-	-	-	-
Maximum Current Demand	L1	45	L2	46	L3	47	III	44
Maximum Active Power Demand	-	-	-	-	-	-	III	42
Maximum Apparent Power Demand	-	-	-	-	-	-	III	43

Table 41: Code of the parameters for programming the measurement alarm.

Parameter	Code
Active Energy consumed	49
Inductive Reactive Energy consumed	51
Capacitive Reactive Energy consumed	53
Apparent energy consumed	55
Active Energy generated	59
Inductive Reactive Energy generated	61
Capacitive Reactive Energy generated	63
Apparent Energy generated	65

There are also some parameters (**Table 42**) that make reference to the three phases at the same time (OR function). If one of these variables is selected, the alarm will be activated when any of the three phases meets the programmed conditions.

Table 42:Codes of the multiple parameters for programming the alarm.

Type of parameter	Code
Phase-Neutral Voltage	200
Current	201
Active Power	202
Inductive Reactive Power	203
Capacitive Reactive Power	204
Power factor	205
Phase-Phase Voltage	206
% THD V	207
% THD A	208
Apparent Power	209

7.3.11.6. Communications

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 43:Modbus memory map: Communications

Communications			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Protocol	2742	**0 :** Modbus	0
Peripheral number	2743	**0 - 255**	1
Transmission speed	2744	**0:** 9600 **- 1:**19200	0
Parity	2745	**0:** No parity **1:** Odd parity **2:** Even parity	0
Data bits	2746	**0 :** 8-bit **1:** 7 bits	0
Stop bits	2747	**0 :** 1 stop bit **1:** 2 stop bits	0

7.3.11.7. Nominal frequency

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 44:Modbus memory map: Nominal frequency

Nominal frequency			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Nominal frequency	C360	**0x32:** 50 Hz **0x3C:** 60 Hz	0x32

7.3.11.8. Sensitivity current IΔn

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 45:Modbus memory map: Sensitivity current

Sensitivity current IΔn			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Sensitivity current	C361	**0:** 30 mA **1:** 0.1 A **2:** 0.3 A **3:** 0.5 A **4:** 1 A	0

7.3.11.9. Activation delay

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 46:Modbus memory map: Activation delay

Activation delay			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Activation delay	C362	**0:** INS curve **1:** SEL curve **3:** 0.1 s **4:** 0.2 s **5:** 0.3 s **6:** 0.4 s **7:** 0.5 s **8:** 0.8 s **9:** 1 s	0

7.3.11.10. Reclosing sequence

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 47:Modbus memory map: Reclosing sequence

Reclosing sequence			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Earth leakage reclosing sequence	C368	**0 ... 14** (according to **DI** in **Table 20**)	10
Circuit breaker reclosing sequence	C369	**0 ... 8** (according to MA in **Table 21**)	5

7.3.11.11. Configuration of the REC LOCKED and POSITIVE SAFE OUTPUT relays

The **Functions 0x04** and **0x10** are implemented for this variable.

Table 48:Modbus memory map: Configuration of the relays

Configuration of the REC LOCKED and POSITIVE SAFE OUTPUT relays			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Type of contact, REC LOCKED relay	C366	**0: STD**, without positive safety **1: POS**, with positive safety	1
Type of contact, POSITIVE SAFE OUTPUT relay	C367	**0: STD**, without positive safety **1: POS**, with positive safety	1

7.3.11.12. Enable reclosing

The **Function 0x04** is implemented for this variable.
This variable allows you to enable or not the reclosing of the device.

Table 49:Modbus memory map: Enable reclosing

Enable reclosing			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Enable reclosing	C391	**0: No** **1: Yes**	1

7.3.11.13. Trip and reset of the device

The **Function 0x10** is implemented for this variable.
This variable allows you to read or force the working mode of the device.

Table 50:Modbus memory map: Trip and reset of the device

Trip or reset of the device			
Configuration variable	**Address**	**Valid data margin**	**Default value**
Trip or reset of the device	C3AC	**1:** Trip **2:** Reset **3:** Reset of the device	0

8.- TECHNICAL FEATURES

Power supply	
Mode	Self-powered (L1-N)
Rated voltage	230 V ~ ± 20%
Frequency	50 - 60 Hz
Maximum power	7 VA
Uimp 4kV	4 kV
Eearthing systems	VT - TN
Installation category	CAT III 300V

Voltage measurement circuit	
Rated voltage (Un)	230 V ~ ± 20%
Frequency measurement margin	50 - 60 Hz
Input impedance	400 kΩ
Installation category	CAT III 300V

Current measurement circuit		
Transformer type	**RECmax-CVM 2-pole**	**RECmax-CVM 4-pole**
	MC1-75/0.25A	MC3-75/0.25A
Rated current (In)	.../250 mA	
Current measurement margin	1 ... 100% In	
Minimum current measurement (Istart)	0.2% In	
Installation category	CAT III 300V	

Measurement accuracy (1)	
Voltage measurement	0.5% ± 1 digit
Current measurement	0.5% ± 1 digit
Neutral current measurement (2)	5 % (for INEUTRAL > 10% FS)
Active power measurement	1% ± 2 digits
Reactive power measurement	2% ± 2 digits
Active energy measurement	1 %
Reactive energy measurement	2 %

(1) Accuracy is given by the following measurement conditions: Exclusion of errors provided by the phase current transformer.
(2) The Neutral current is a value calculated from the vector sum of the measurements of the phase currents.

Earth leakage protection		
Sensitivity, IΔn	30 mA - 0.1 A - 0.3 A - 0.5 A - 1 A (programmable)	
Trip delay (IEC 60947-2-M)	Programmable	
External earth leakage transformer		
Transformer type	**RECmax-CVM 2-pole**	**RECmax-CVM 4-pole**
	WGC-20SC	WGC-30SC
Internal diameters	20 mm	30 mm
Rated current (In)	75 A	75 A
Rated motor circuit voltage (Un)	720 V ~	720 V ~
Maximum current (Imax)	450 A	450 A
Maximum short-time withstand current (< 50 ms) (Icw)	1.5 kA	1.5 kA

Circuit breaker protection			
Rated current (In)	6 - 10 - 16 - 20 - 25 - 32 - 40 - 50 - 63 A ~		
Rated voltage (Un)	240 / 415 V ~		
Magnetic trip curves	C / D		
Cross-section	**Flexible cable**	**Rigid cable**	
	25 mm^2	35 mm^2	
Number of poles	**RECmax-CVM 2-pole**	**RECmax-CVM 4-pole**	
	2	4	
Maximum torque	4.5 Nm		
Residual earth leakage current	0.851 **I∆n**		
Breaking capacity (EN 60898)	**Poles**	**Voltage**	**Icn / Ics**
	1 - 4	230 / 400 V	6 kA
Breaking capacity (EN 60947-2) ⎓	**Poles**	**Voltage**	**Icu / Ics**
	2	< 125 V	30 kA
Breaking capacity (EN 60947-2) ~	**Poles**	**Voltage**	**Icu**
	2	127 V	30 kA
		240 V	20 kA
		415 V	10 kA
	4	240 V	20 kA
		415 V	10 kA

Automatic reclosing	
Successive attempts by earth leakage	programmable (by default: 10)
Successive attempts by circuit breaker	programmable (by default: 2)
Timer between successive attempts	programmable (by default: 3 min.)
Meter reset time after last reclosing	programmable (by default: 30 min.)

Inputs: EXT ON/OFF and EXT LOCKED	
Type	Voltage-free
Insulation	Double insulation

Outputs REC LOCKED and POSITIVE SAFE OUTPUT alarms	
Type	Solid-state relay
Maximum voltage	600 V
Maximum current	120 mA
Maximum power	500 mW
Installation category	CAT III 300V

Digital Output	
Type	NPN optoisolated transistor
Maximum voltage	24 V⎓
Maximum current	50 mA
Maximum frequency	16 imp/s.
Pulse width	30 ... 500 ms (programmable)

BREAKER ON/OFF output	
Type	Microswitch
Maximum voltage	230 V ~
Maximum current	0.5 A
Maximum power	60 VA
Installation category	CAT III 300V

Communications	
Bus	RS-485
Communications protocol	Modbus RTU
Baud rate	9600 bauds
Stop bits	1
Parity	None
Peripheral number (default)	1

User interface	
Display	LCD
Keyboard	3 keys
LED	2 LEDs

Environmental features	
Operating temperature	-10ºC to +55ºC
Storage temperature	-30ºC ... +70ºC
Relative humidity (without condensation)	5 ... 95%
Maximum altitude	2000 m
Protection degree	IP20
Pollution degree	Category 2

Mechanical features		
Dimensions	**RECmax-CVM 2-pole**	**RECmax-CVM 4-pole**
	Figure 28	**Figure 29**
Weight	520 g.	790 g.
Enclosure	V0 self-extinguishing plastic	
Attachment	DIN rail	

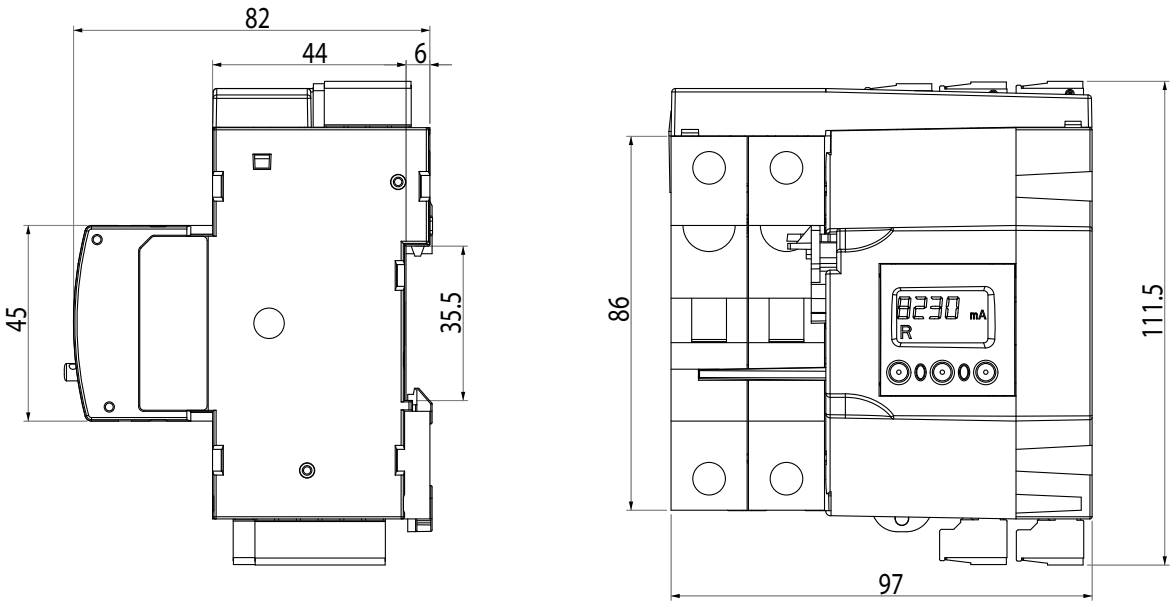


Figure 28: Dimensions of the RECmax-CVM 2-pole.

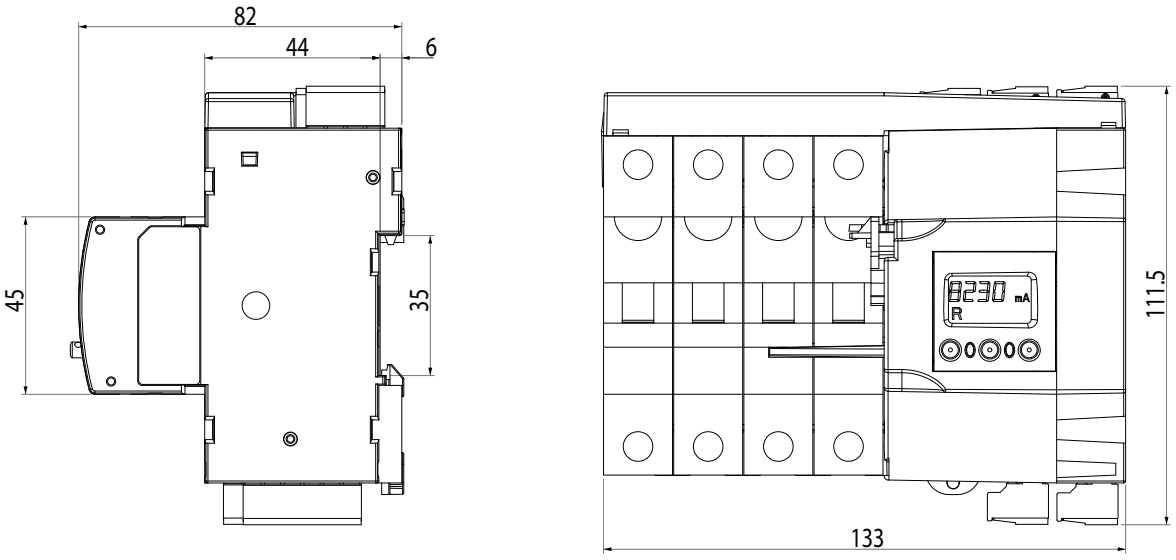


Figure 29: Dimensions of the RECmax-CVM 4-pole.

Standards	
General requirements for residual current operated protective devices	IEC TR 60755:2008
Electrical accessories - Circuit breakers for overcurrent protection for household and similar installations -- Part 1: Circuit-breakers for a.c. operation	UNE-EN 60898-1:2004
Specification for low voltage switchgear and control gear for industrial use. Mounting rails. Top hat rails 35 mm wide for snap-on mounting of equipment	DIN EN 50022
Low-voltage switchgear and controlgear -- Part 2: Circuit-breakers	UNE-EN 60947-2: 2007 annex M
Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 1: General requirements	UNE-EN 61010-1:2010, 3rd Edition
Electromagnetic compatibility (EMC) -- Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006).	UNE-EN 61000-6-4:2007
Electricity metering equipment (a.c.) - Particular requirements -- Part 21: Static meters for active energy (classes 1 and 2)	IEC 62053-21:2003
Electricity metering equipment (a.c.) - Particular requirements -- Part 23: Static meters for reactive energy (classes 2 and 3).	IEC 62053-23:2003
Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. - Equipment for testing, measuring or monitoring of protective measures -- Part 12: Performance measuring and monitoring devices (PMD)	IEC 61557-12:2007

9.- TECHNICAL SERVICE

In the case of any query in relation to device operation or malfunction, please contact the **CIRCUTOR, SA** Technical Support Service.

Technical Assistance Service
Vial Sant Jordi, s/n, 08232 - Viladecavalls (Barcelona)
Tel: 902 449 459 (España) / +34 937 452 919 (outside of Spain)
email: sat@circutor.com

10.- WARRANTY

CIRCUTOR guarantees its products against any manufacturing defect for two years after the delivery of the units.

CIRCUTOR will repair or replace any defective factory product returned during the guarantee period.

• No returns will be accepted and no unit will be repaired or replaced if it is not accompanied by a report indicating the defect detected or the reason for the return.
•The guarantee will be void if the units has been improperly used or the storage, installation and maintenance instructions listed in this manual have not been followed. “Improper usage” is defined as any operating or storage condition contrary to the national electrical code or that surpasses the limits indicated in the technical and environmental features of this manual.
• **CIRCUTOR** accepts no liability due to the possible damage to the unit or other parts of the installation, nor will it cover any possible sanctions derived from a possible failure, improper installation or “improper usage” of the unit. Consequently, this guarantee does not apply to failures occurring in the following cases:
- Overvoltages and/or electrical disturbances in the supply;
- Water, if the product does not have the appropriate IP classification;
- Poor ventilation and/or excessive temperatures;
- Improper installation and/or lack of maintenance;
- Buyer repairs or modifications without the manufacturer’s authorisation.

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(ES) DECLARACIÓN UE DE CONFORMIDAD

La presente declaración de conformidad se expide bajo la exclusiva responsabilidad de CIRCUTOR con dirección en Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) España

Producto:

Magnetotérmico diferencial con reconexión automática y medida

Serie:

RECmax-CVM

Marca:

CIRCUTOR

El objeto de la declaración es conforme con la legislación de armonización pertinente en la UE, siempre que sea instalado, mantenido y usado en la aplicación para la que ha sido fabricado, de acuerdo con las normas de instalación aplicables y las instrucciones del fabricante

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

Está en conformidad con la(s) siguiente(s) norma(s) u otro(s) documento(s) normativos(s):

IEC 61000-6-2:2016 Ed 3.0 IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0 IEC 60947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0 IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0 IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Año de marcado "CE":

2017

(EN) EU DECLARATION OF CONFORMITY

This declaration of conformity is issued under the sole responsibility of CIRCUTOR with registered address at Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spain

Product:

Earth leakage circuit breaker with automatic reclosing and measurement

Series:

RECmax-CVM

Brand:

CIRCUTOR

The object of the declaration is in conformity with the relevant EU harmonisation legislation, provided that it is installed, maintained and used for the application for which it was manufactured, in accordance with the applicable installation standards and the manufacturer's instructions

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

It is in conformity with the following standard(s) or other regulatory document(s):

IEC 61000-6-2:2016 Ed 3.0 IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0 IEC 60947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0 IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0 IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Year of CE mark:

2017

(FR) DÉCLARATION UE DE CONFORMITÉ

La présente déclaration de conformité est délivrée sous la responsabilité exclusive de CIRCUTOR dont l'adresse postale est Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelone) Espagne

Produit:

Magnétothermique et différentiel à reconnexion automatique et mesure

Série:

RECmax-CVM

Marque:

CIRCUTOR

L'objet de la déclaration est conforme à la législation d'harmonisation pertinente dans l'UE, à condition d'avoir été installé, entretenu et utilisé dans l'application pour laquelle il a été fabriqué, conformément aux normes d'installation applicables et aux instructions du fabricant

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

Il est en conformité avec la(les) suivante (s) norme(s) ou autre(s) document(a) réglementaire (s):

IEC 61000-6-2:2016 Ed 3.0 IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0 IEC 60947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0 IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0 IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Année de marquage « CE »:

2017

Viladecavalls (Spain), 26/10/2017
General Manager: Ferran Gil Torné

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(DE)

KONFORMITÄTSERKLÄRUNG UE

Vorliegende Konformitätserklärung wird unter alleiniger Verantwortung von CIRCUTOR mit der Anschrift, Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spanien, ausgestellt

Produkt:

Überstrom- und Differenzstromschutz mit automatischer Wiedereinschaltung und Messung

Serie:

RECmax-CVM

Marke:

CIRCUTOR

Der Gegenstand der Konformitätserklärung ist konform mit der geltenden Gesetzgebung zur Harmonisierung der EU, sofern die Installation, Wartung und Verwendung der Anwendung seinem Verwendungszweck entsprechend gemäß den geltenden Installationsstandards und der Vorgaben des Herstellers erfolgt.

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

Es besteht Konformität mit der/den folgender/folgenden Norm/Normen oder sonstigem/sonstiger Regelwerk/Regelwerken

IEC 61000-6-2:2016 Ed 3.0	IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0	IEC 62947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0	IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0	IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Jahr der CE-Kennzeichnung:

2017

(PT)

DECLARAÇÃO DA UE DE CONFORMIDADE

A presente declaração de conformidade é expedida sob a exclusiva responsabilidade da CIRCUTOR com morada em Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Espanha

Producto:

Magnetotérmico diferencial com reconexão automática e medição

Série:

RECmax-CVM

Marca:

CIRCUTOR

O objeto da declaração está conforme a legislação de harmonização pertinente na UE, sempre que seja instalado, mantido e utilizado na aplicação para a qual foi fabricado, de acordo com as normas de instalação aplicáveis e as instruções do fabricante.

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

Está em conformidade com a(s) seguinte(s) norma(s) ou outro(s) documento(s) normativo(s):

IEC 61000-6-2:2016 Ed 3.0	IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0	IEC 62947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0	IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0	IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Ano de marcação "CE":

2017

(IT)

DICHIARAZIONE DI CONFORMITÀ UE

La presente dichiarazione di conformità viene rilasciata sotto la responsabilità esclusiva di CIRCUTOR, con sede in Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcellona) Spagna

prodotto:

Magnetotermici differenziale con riconnessione e misurazione automatica

Serie:

RECmax-CVM

MARCHIO:

CIRCUTOR

L'oggetto della dichiarazione è conforme alla pertinente normativa di armonizzazione dell'Unione Europea, a condizione che venga installato, mantenuto e utilizzato nell'ambito dell'applicazione per cui è stato prodotto, secondo le norme di installazione applicabili e le istruzioni del produttore.

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

È conforme alle seguenti normative o altri documenti normativi:

IEC 61000-6-2:2016 Ed 3.0	IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0	IEC 62947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0	IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0	IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Anno di marcatura "CE":

2017

Viladecavalls (Spain), 26/10/2017
General Manager: Ferran Gil Torné

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(PL)

DEKLARACJA ZGODNOŚCI UE

Niniejsza deklaracja zgodności zostaje wydana na wyłączną odpowiedzialność firmy CIRCUTOR z siedzibą pod adresem: **Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Hiszpania**

produkt:

Magnetotermiczny wyłącznik różnicowy z automatycznym ponownym załączaniem i funkcją pomiaru

Seria:

RECmax-CVM

marka:

CIRCUTOR

Przedmiot deklaracji jest zgodny z odnośnymi wymaganiami prawodawstwa harmonizacyjnego w Unii Europejskiej pod warunkiem, że będzie instalowany, konserwowany i użytkowany zgodnie z przeznaczeniem, dla którego został wyprodukowany, zgodnie z mającymi zastosowanie normami dotyczącymi instalacji oraz instrukcjami producenta

2014/35/UE: Low Voltage Directive 2014/30/UE: Electromagnetic Compatibility Directive

2011/65/UE: RoHS2 Directive

Jest zgodny z następującą(ymi) normą(ami) lub innym(i) dokumentem(ami) normatywnym(i):

IEC 61000-6-2:2016 Ed 3.0	IEC 61000-6-4:2006+AMD1:2010 CSV Ed 2.1
IEC 60898-1:2015 Ed 2.0	IEC 60947-2:2006+AMD1:2009+AMD2:2013 CSV Ed 4.2 Annex M
IEC TR 60755:2008 Ed 2.0	IEC 61557-12:2007 Ed 1.0
IEC 61326-1:2012 Ed 2.0	IEC 61010-1:2010+AMD1:2016 CSV Ed 3.0

Rok oznakowania "CE":

2017

Viladecavalls (Spain), 26/10/2017
General Manager: Ferran Gil Torné

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