

# Circutor

AC Voltmeter

DCB-48 Vac



**INSTRUCTION MANUAL**

(M212B01-03-19A)

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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## REVISION LOG

**Table 1: Revision log.**

Date	Revision	Description
06/18	M212B01-03-18A	Initial Version
12/18	M212B01-03-18B	Changes in the following sections: 3.3. - 3.4. - 9.
04/19	M212B01-03-19A	Changes in the following sections: 2. - Annex A

## SYMBOLS

**Table 2: Symbols.**

Symbol	Description
	In compliance with the relevant European directive.
	Device covered by European directive 2012/19/EC. At the end of its useful life, do not leave the unit in a household waste container. Follow local regulations on electronic equipment recycling.
	DC current
	AC current

**Note :** Devices images are for illustrative purposes only and may differ from the actual device.

## 1.- VERIFICATION UPON RECEPTION

Check the following points when you receive the device:

- a) The device meets the specifications described in your order.
- b) The device has not suffered any damage during transport.
- c) Perform an external visual inspection of the device prior to switching it on.
- d) Check that it has been delivered with the following:
  - An installation guide,



If any problem is noticed upon reception, immediately contact the transport company and/or **CIRCUTOR's** after-sales service.

## 2.- PRODUCT DESCRIPTION

The **DCB-48 Vac** is a device designed to measure and display the voltage and the frequency AC single-phase. The device has 6 programmable voltage scales: 63.5V, 100V, 110V, 230 V, 380 V and 480 V.



The device features:

- **4 keys** that allow you to browse between the various screens and program the device.
- **LED display**, displays all parameters,

Table 3:DCB-48 Vac list of models.

Model	Power Supply		
	80 ... 270 V ~	80 ... 270 V ==	18 ... 36 V ==
M22110	✓	✓	-
M221100030000	-	-	✓

### 3.- DEVICE INSTALLATION

#### 3.1.- PRIOR RECOMMENDATIONS



In order to use the device safely, it is critical that individuals who handle it follow the safety measures set out in the standards of the country where it is being used, use the necessary personal protective equipment, and pay attention to the various warnings indicated in this instruction manual.

The **DCB-48 Vac** device must be installed by authorised and qualified staff.

The power supply plug must be disconnected and measuring systems switched off before handling, altering the connections or replacing the device. It is dangerous to handle the device while it is powered.

Also, it is critical to keep the cables in perfect condition in order to avoid accidents, personal injury and damage to installations.

The device's functionality is limited to the category of measuring voltage or specific current values.

The manufacturer of the device is not responsible for any damage resulting from failure by the user or installer to heed the warnings and/or recommendations set out in this manual, nor for damage resulting from the use of non-original products or accessories or those made by other manufacturers.

If an anomaly or malfunction is detected in the device, do not use it to take any measurements.



Disconnect the device from the power supply (device and measuring system power supply) before maintaining, repairing or handling the device's connections. Please contact the after-sales service if you suspect that there is an operational fault in the device.

## 3.2.- INSTALLATION



Terminals, opening covers or removing elements can expose parts that are hazardous to the touch while the device is powered. Do not use the device until it is fully installed.

The device should be installed inside an electric panel or enclosure, and panel-mounted.

To install it, take the following steps:

1.- Make a cut in the panel, according to the dimensions in **Figure 1**.

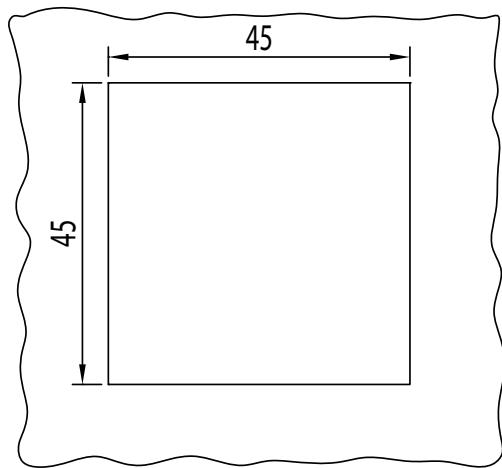


Figure 1: Cut in the panel.

2.- Remove the device's mounting frame (**Figure 2**).

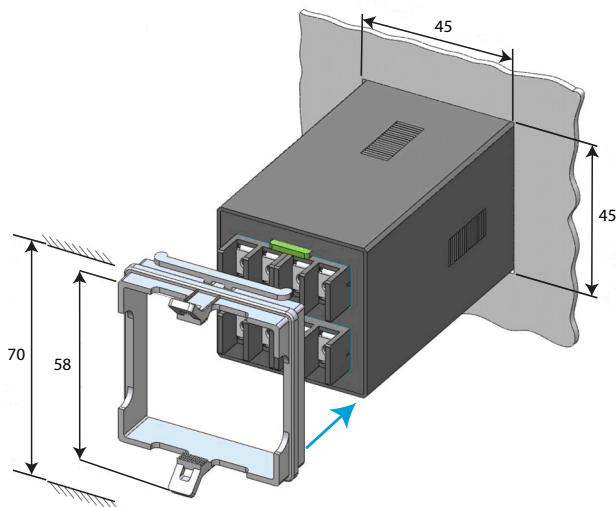


Figure 2: Installation.

3.- Insert the device into the cut in the panel.

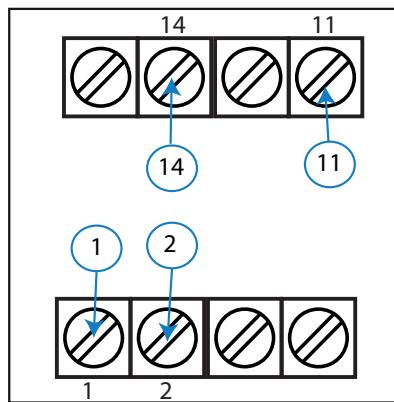
4.- Fit the mounting frame until the device is fixed to the panel.

The device should be connected to a power circuit protected by a fuse with a maximum nominal current of **0.25 A**.

### 3.3.- DEVICE TERMINALS

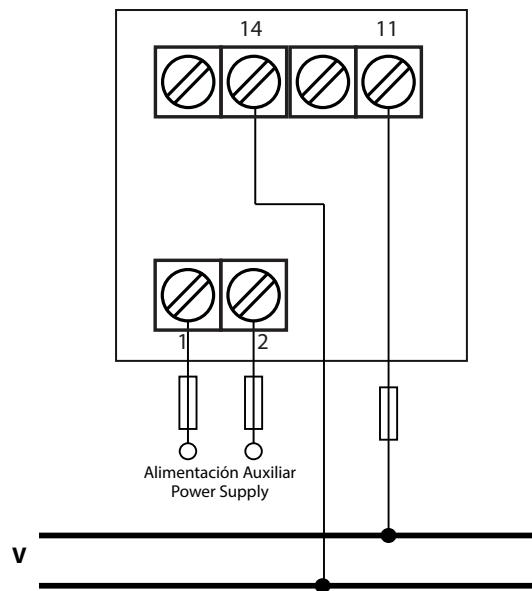
**Table 4:**List of terminals of the DCB-48 Vac.

Device terminals	
<b>1 : L</b> , Auxiliary power supply.	<b>11:</b> Voltage measurement input
<b>2: N</b> , Auxiliary power supply.	<b>14:</b> Voltage measurement input



**Figure 3:**Terminals of the DCB-48 Vac.

### 3.4.- CONNECTION DIAGRAM



**Figure 4:** Voltage measurement DCB-48 Vac.

If the voltage being measured is higher than the rated input voltage, a voltage transformer should be connected to the device.

## 4.- OPERATION

### 4.1.- DISPLAY

The device features a 4-digit LED display, which is used to display the measured parameters and to configure these parameters

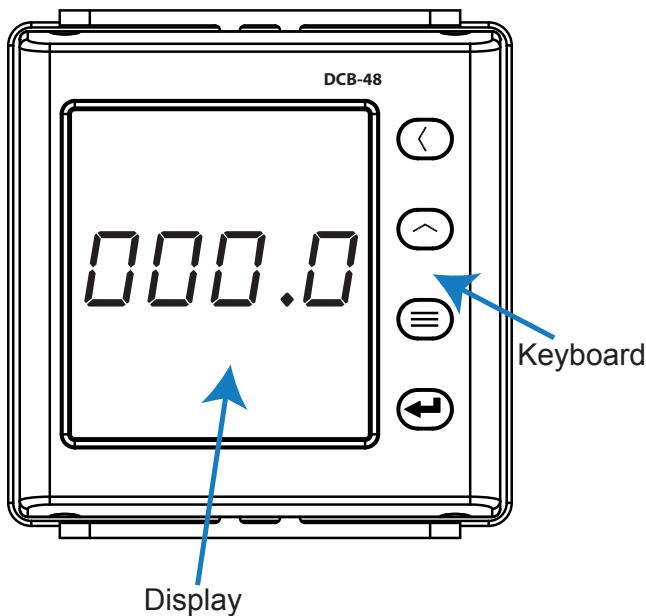


Figure 5: Display DCB-48.

### 4.2.- KEYBOARD FUNCTIONS

The **DCB-48 Vac** features 4 keys to display and configure the device, **Figure 5**.

Table 5: Keyboard functions.

Key	Keystroke
	Previous screen <b>In the configuration menu:</b> Scroll through the digits
	Next screen <b>In the configuration menu:</b> Increase the value of the digit
	<b>Long keystroke (&gt; 3s):</b> Enter in configuration menu
	<b>In the configuration menu:</b> Jump to the next level / Confirm an operation

**4.3.- DISPLAY**

The **DCB-48 Vac** features 2 display screens, **Table 6**.

Use the and keys to browse the screens.

**Table 6: Display menu.**

Display menu	
Voltage	
Frequency	

If the voltage value measured by the device is higher than a % of the nominal value, the device can make the digits on the display start flashing, in the form of a light alarm. See “**5.2.3.- LIGHT ALARM**”

## 5.- CONFIGURATION

Press and hold the  key for more than 3 seconds to enter the configuration menu of the device.

The configuration of the device is organized in different menus, **Figure 6**.

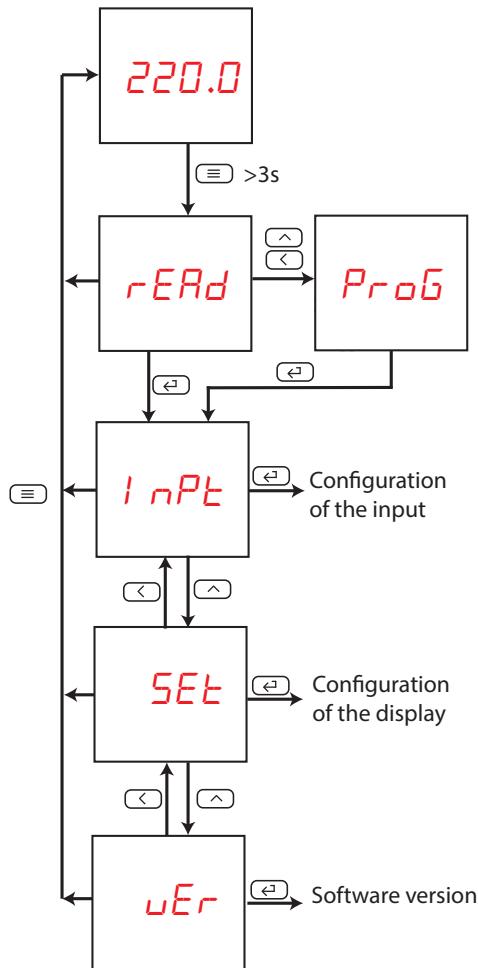


Figure 6: Configuration menu of the DCB-48 Vac.

From any screen of the configuration menus, if no key is pressed for 4 minutes, the device leaves the configuration menu and returns to the display screen.

On the *rERd* screen, press the  or  key to access the configuration menu in the **display mode**, i.e., the configuration parameters cannot be modified.

On the *rERd* screen, press the  or  keys to access the configuration menu in the **programming mode**, i.e., the configuration parameters can be modified.

**Note:** In “ANNEX A.- CONFIGURATION MENU” you can see the complete configuration menu.

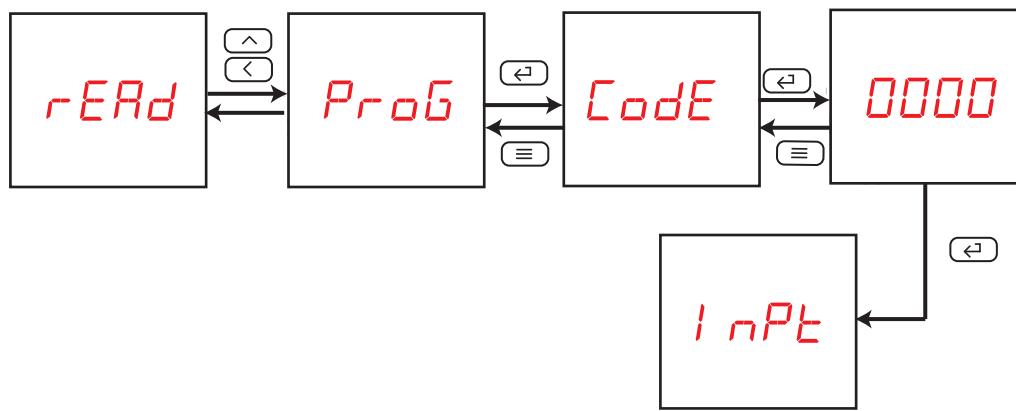


Figure 7: Access the configuration menu in the programming mode.

Before accessing the configuration menu, it is necessary to enter the access password.

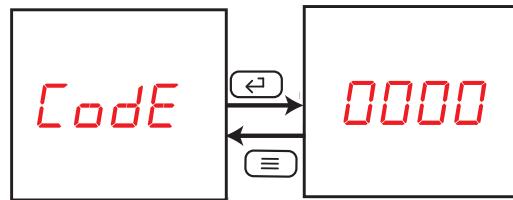


Figure 8: Access password.

Use the key to modify the value of the flashing digit

When the desired value is shown on the screen, press the key to skip the digit.

**Default password:** 0001

**Note :** The password can be modified, see “5.2.1.- PASSWORD OF ACCESS”.

To validate the data, press the key.

If the password entered is incorrect, the *Err* message will appear for a few seconds and the device will return to the password configuration screen, **Figure 8**.

## 5.1.- CONFIGURATION OF THE INPUT

**Figure 9**, shows the main screen of the input configuration menu, from which the primary voltage and secondary voltage are configured.

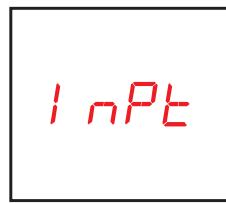


Figure 9: Input configuration menu, main screen.

Press the key to open the configuration menu.

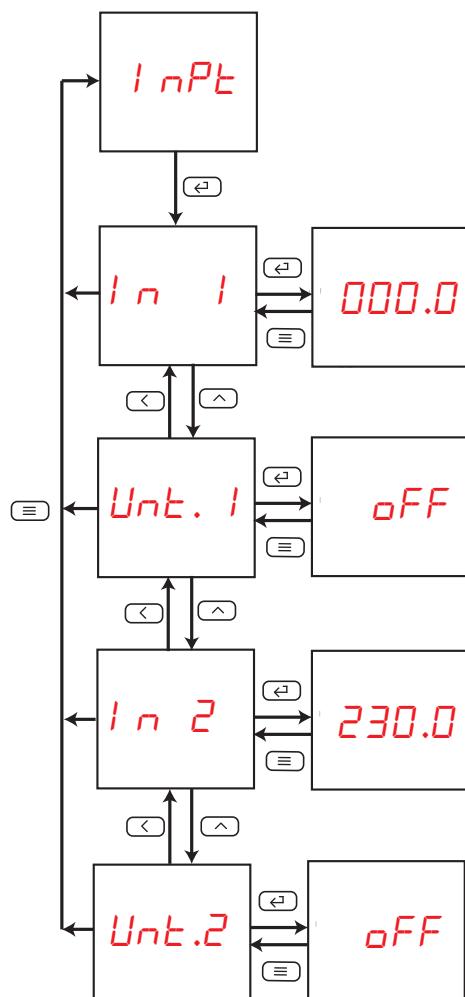
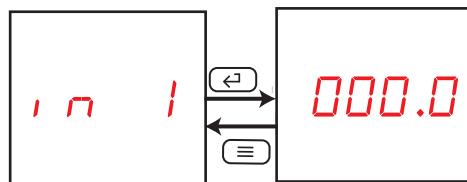


Figure 10:Input configuration menu.

### 5.1.1.- PRIMARY VOLTAGE

This screen is used to configure the value of the primary voltage.



Use the key to modify the value of the flashing digit

When the desired value is shown on the screen, press the key to skip the digit.

When you reach the last digit and press the key, you select the position of the decimal point. Use the to modify the decimal point.

**Minimum configuration value:** 1.000.

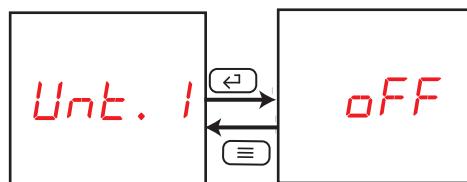
**Maximum configuration value:** 9999.

To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

### 5.1.2.- UNITS OF THE PRIMARY VOLTAGE

This screen is used to configure the units of the primary voltage.



Use the key to browse the different options:

OFF, the unit of the primary voltage is **V**.

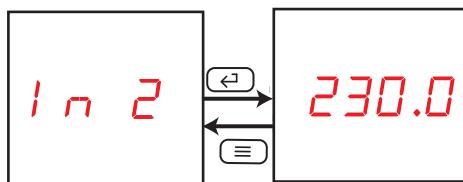
ON, the unit of the primary voltage is **kV**.

To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

### 5.1.3.- SECONDARY VOLTAGE

This screen is used to configure the value of the secondary voltage.



Use the and keys at the same time to configure the value.

Use the key to browse the different options:

3.5, for the voltage scale of 0 ... 63.5 V.

100.0, for the voltage scale of 0 ... 100 V.

110.0, for the voltage scale of 0 ... 110 V.

230.0, for the voltage scale of 0 ... 230 V.

380.0, for the voltage scale of 0 ... 380 V.

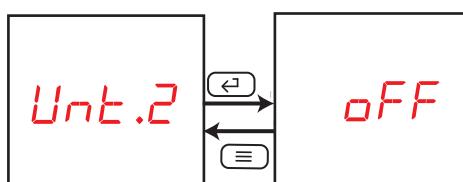
480.0, for the voltage scale of 0 ... 480 V.

To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

### 5.1.4.- UNITS OF THE SECONDARY VOLTAGE

**Note:** This parameter cannot be modified.

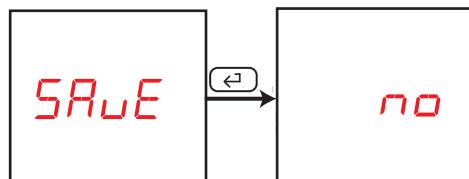


Use the and keys to browse the configuration screens of the menu.

### 5.1.5.- SAVE CONFIGURATION

To save the configuration of the device, press the  key, until the main screen of the input configuration menu is opened, **Figure 9.**

Press the  key again to show the validation screen.



Use the , key to browse the different options:

**no**, exit the configuration without saving the changed values.

**YES**, save the changed configuration values.

Press the  key to validate the data and exit the configuration menu.

## 5.2.- CONFIGURATION OF THE DISPLAY

Figure 11, shows the main screen of the configuration menu of the display.

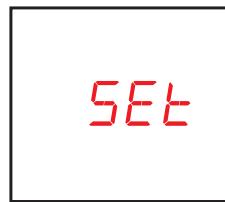


Figure 11: Configuration menu of the display, main screen.

Press the key to open the configuration menu.

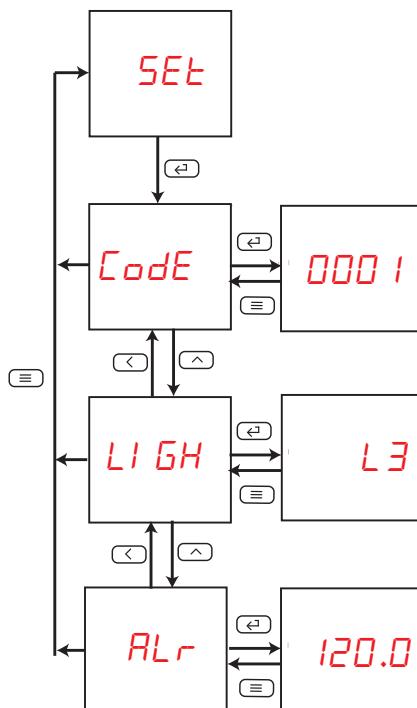
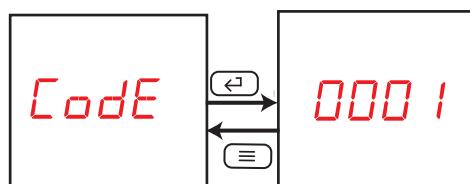


Figure 12: Configuration menu of the display.

### 5.2.1.- PASSWORD OFF ACCESS

This screen is used to configure the value of the password used to access the configuration menu in the **programming mode**.



Use the , key to modify the value of the flashing digit

When the desired value is shown on the screen, press the key to skip the digit.

**Minimum configuration value:** 0

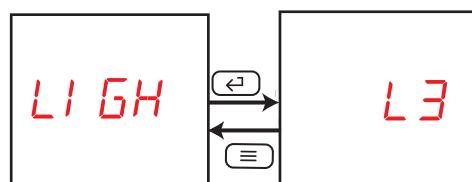
**Maximum configuration value:** 9999

To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

### 5.2.2.- BRIGHTNESS OF THE DISPLAY

The brightness of the display is configured on this screen.



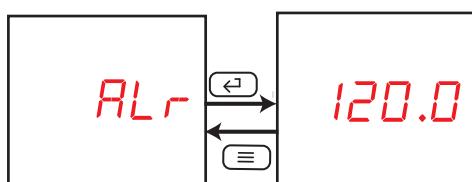
Use the key to browse the different options: the display has 5 brightness levels, from *L 1* to *L 5*.

To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

### 5.2.3.- LIGHT ALARM

If the voltage value measured by the device is higher than a % of the nominal value, the device can make the digits on the display start flashing, in the form of a light alarm.



Use the key to modify the value of the flashing digit.

When the desired value is shown on the screen, press the key to skip the digit.

**Minimum configuration value:** 30.3%

**Maximum configuration value:** 120.0%

**Note:** If the a value of 0 is programmed, the light alarm will be deactivated.

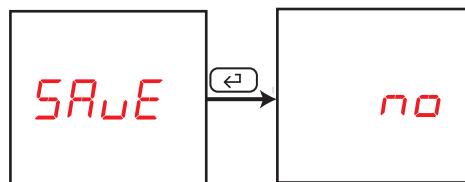
To validate the data, press the key.

Use the and keys to browse the configuration screens of the menu.

#### 5.2.4.- SAVE CONFIGURATION

To save the configuration of the device, press the  key until the main screen of the configuration menu of the display is opened, **Figure 11**.

Press the  key again to show the validation screen.



Use the  key to browse the different options:

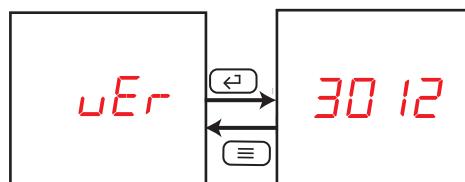
*no*, exit the configuration without saving the changed values.

*YES*, save the changed configuration values.

Press the  key to validate the data and exit the configuration menu.

#### 5.3.- SOFTWARE VERSION

The software version of the device is shown in the **display mode**.



## 6.- TECHNICAL FEATURES

AC Power supply <sup>(1)</sup>	
Rated voltage	80 ... 270 V ~
Frequency	50 / 60 Hz
Consumption	0.5 ... 3 VA
Installation category	CAT III 300 V

DC Power supply <sup>(1)</sup>		
Rated voltage	80 ... 270 V ==	18 ... 36 V ==
Consumption	0.3 ... 0.4 W	
Installation category	CAT III 300 V	

<sup>(1)</sup> Depending on model :

Model	Power supply		
	80 ... 270 V ~	80 ... 270 V ==	18 ... 24 V ==
M22110	✓	✓	-
M221100030000	-	-	✓

Current measurement circuit	
Nominal Voltage (Un)	63.5 V~ / 100 V~ / 110 V~ / 230 V~ / 380 V~ / 480 V~
Frequency measurement margin	45 ... 65 Hz
Overload	1.2 Un continuous, 2 Un Instantaneous (1min)
Consumption	< 0.2 VA
Impedance	> 1.7 MΩ
Installation category	CAT III 300V

Measurement accuracy	
Voltage measurement	0.5%

User interface	
Display	LED 4 digits
Keyboard	4 keys

Environmental features	
Operating temperature	-40°C ... +70°C
Storage temperature	-40°C ... +85°C
Relative humidity	≤ 95%
Maximum altitude	2000 m
Protection degree	Front : IP54, Rear case: IP20
Pollution degree	2

Mechanical features	
Dimensions	Figure 13 (mm)
Weight	101 g.
Surround	pc + abs

Standards	
Electromagnetic compatibility (EMC) -- Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test.	IEC 61000-4-2
Electromagnetic compatibility (EMC)- Part 4-3: Testing and measurement techniques- Radiated, radio-frequency, electromagnetic field immunity test	IEC 61000-4-3
Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	IEC 61000-4-4

(Continuation) Standards	
Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	IEC 61000-4-5
Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	IEC 61000-4-6
Electromagnetic compatibility (EMC) -- Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	IEC 61000-4-8
Electromagnetic compatibility (EMC) -- Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests	IEC 61000-4-11
Safety requirements for electrical equipment for measurement, control and laboratory use -- Part 1: General requirements	IEC 61010-1

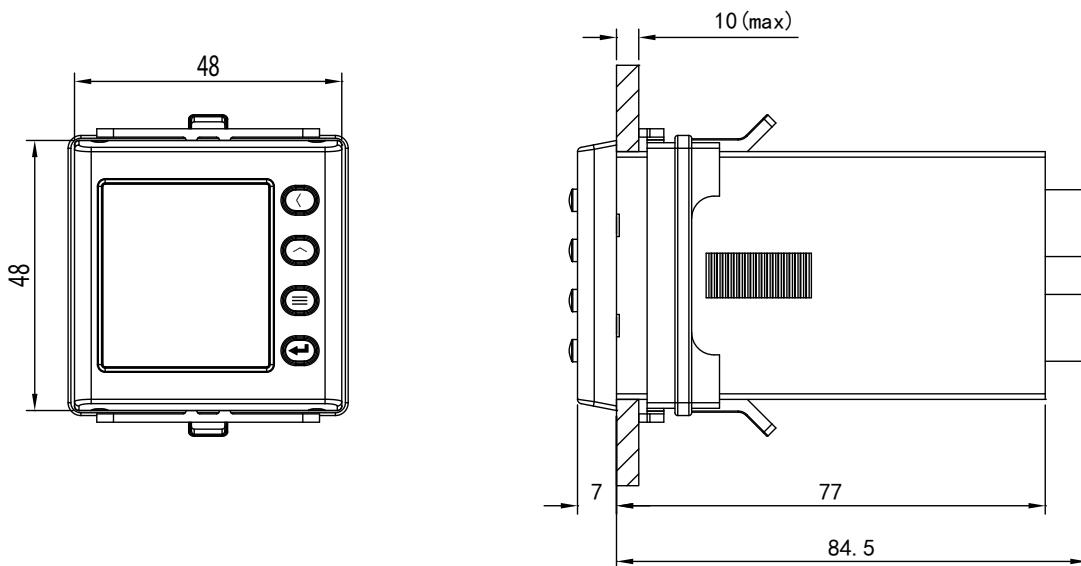


Figure 13: Dimensions of the DCB-48 Vac.

## 7.- MAINTENANCE AND TECHNICAL SERVICE

In the case of any query in relation to unit 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.es

## 8.- GUARANTEE

**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.

## 9.- CE CERTIFICATE

CIRCUTOR, SA – Vial Sant Jordi, s/n  
08232 Viladecavalls (Barcelona) Spain  
(+34) 937 452 900 – info@circutor.com



### 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:

Instrumentación digital

Serie:

DCB-48, DCB-72

Marca:

CIRCUTOR



**DEKLARACJA ZGODNOŚCIUE**

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

produkt:

Digital Instruments

Seria:

DCB-48, DCB-72

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 ca(ymi) normą(ami) lub innym(i) dokumentem(ami) normatywnym(i):

IEC61010-1:2010/AMD1:2016 CSV Ed 3.0      IEC 61000-6-2:2016 Ed 3.0  
IEC61000-6-4:2006/AMD1:2010 CSV Ed 2.1

Rok oznakowania "CE":

2018

Viladecavalls (Spain), 16/05/2018  
General Manager: Ferran Gil Torne



## ANNEX A.- CONFIGURATION MENU

## A.1.- DCB-48 Vac

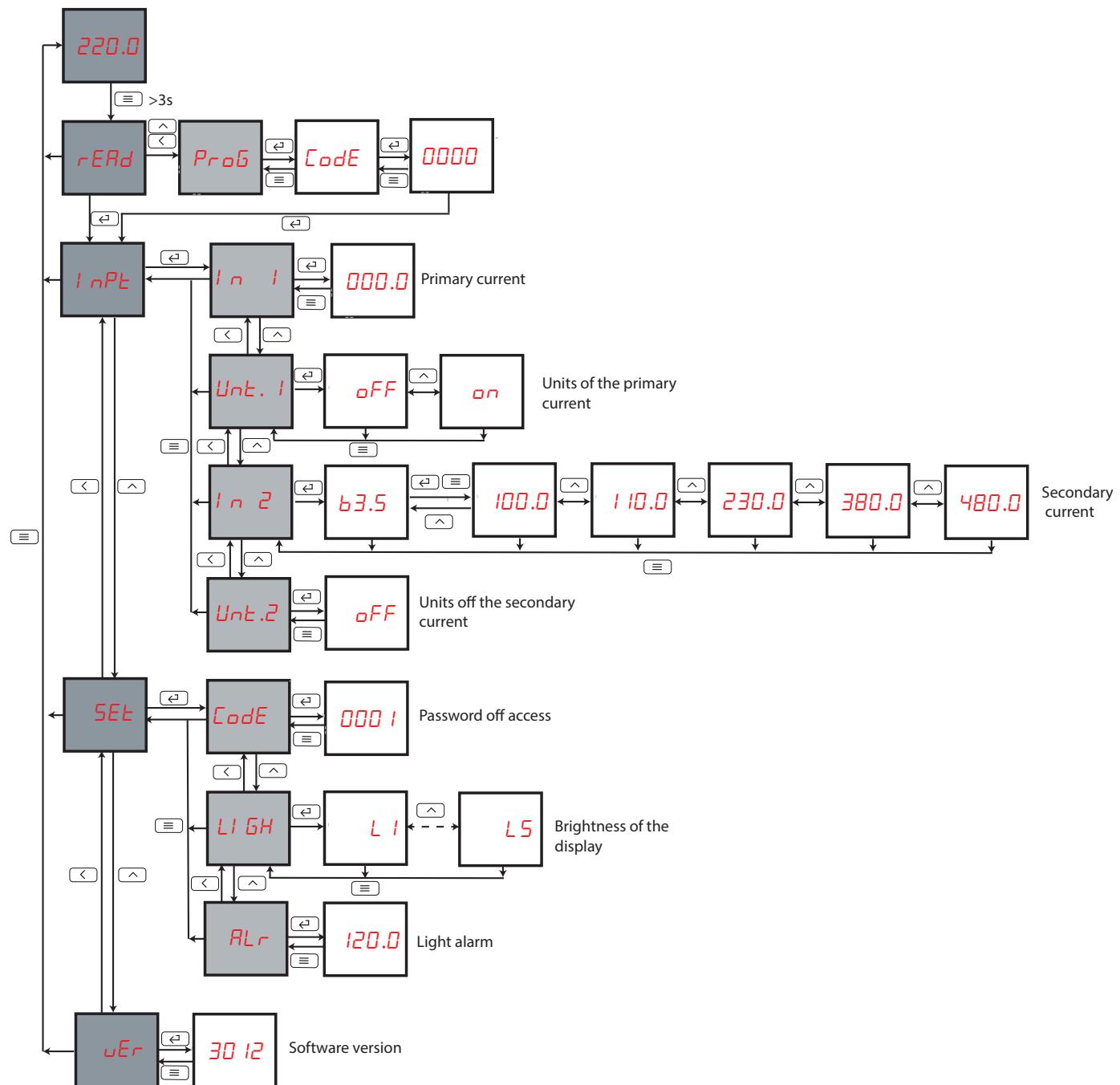


Figure 14: Configuration menu DCB-48 Vac