Multifunctional Energy Meter

CEM-C10
CEM-C10 MID

INSTRUCTION MANUAL

(M009B01-03-21A)

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.

www.circutor.com

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

CONTENTS

Note: *The images of the devices are solely for the purpose of illustration and may differ from the original device.*

REVISION LOG

Table 1: Revision log.

Date	Revision	Description
07/14	M009B01-03-14A	Initial Version
11/14	M009B01-03-14B	Changes in the following sections: 4.2. - 5
06/15	M009B01-03-15A	Changes in the following sections: 2 - 3.5. - 4.4.1. - 4.4.2. - 4.5. - 4.6. - 4.7. - 5
01/17	M009B01-03-17A	Changes in the following sections: 2.- 5.- 8.
10/17	M009B01-03-17B	Changes in the following sections: 5.
09/18	M009B01-03-18A	Changes in the following sections: 3.5.
09/21	M009B01-03-21A	Circutor logo update

1.- VERIFICATION UPON RECEPTION

Check the following points upon receiving the unit:

a) The unit meets the specifications described in your order.
b) The unit has not suffered any damage during transport.
c) Perform an external visual inspection of the unit 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 **CEM-C10** static single-phase energy meter measures class B active energy (EN50470) and (optional) class 2 reactive energy (IEC 62053-23), with optional optical communications for expansion with other modules installed on a DIN rail with a service port.

The unit features:

- **1 key** that allows you to browse the different screens and program the unit.
- **2 Verification** LEDs.
- **LCD display**, displays all parameters,
- **2 connection seals,**
- **2 terminal covers**, to cover the top of the terminal box and the fixing screws.

3.- UNIT INSTALLATION

3.1.- PRELIMINARY RECOMMENDATIONS

	In order to use the unit 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 **CEM-C10** unit 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 unit. It is dangerous to handle the unit 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 manufacturer of the unit is not responsible for any damage resulting from failure by the user or installer to observe 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 unit, do not use the unit to take any measurements.

Inspect the work area before taking any measurements. Do not take measurements in dangerous areas or where there is a risk of explosion.

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

3.2.- INSTALLATION

On the side of the unit are all of the indications adjusted to the CEI 62052-11 standard.

The unit is installed on a DIN rail. All connections are located inside the electric panel.

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

3.3.- UNIT TERMINALS

Table 2:List of CEM-C10 terminals.

Unit terminals	
1 : L, Input, connected to the mains phase	**6: LOAD**, Output
3: LOAD, Output	**21:** impulse output (Collector)
4: N, Input, connected to neutral	**22:** Impulse output (Emitter)

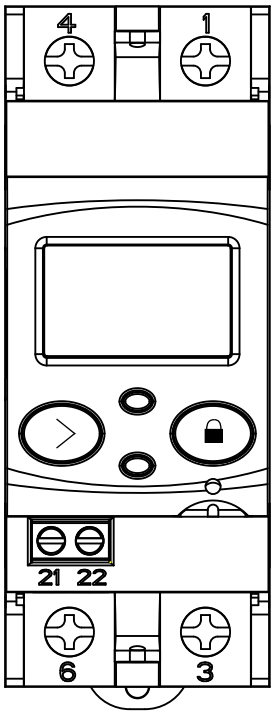


Figure 1:Terminals of the CEM-C10.

3.4.- CONNECTION DIAGRAM

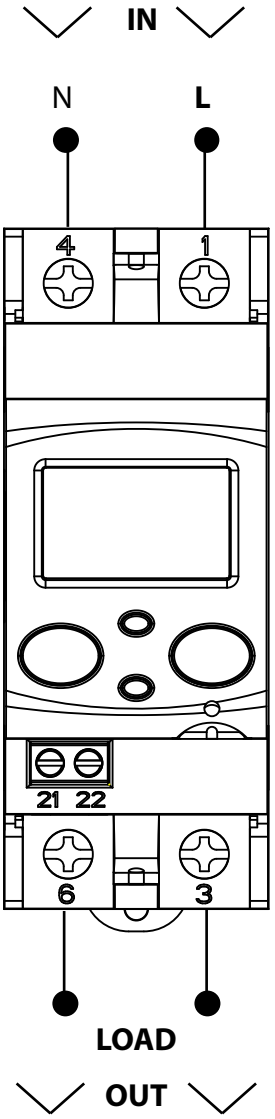


Figure 2: Connection diagram, CEM-C10.

3.5.- CONNECTIONS

The **CEM-C10** has terminal covers to cover the top of the terminal box and the fixing screws (**Figure 3**).

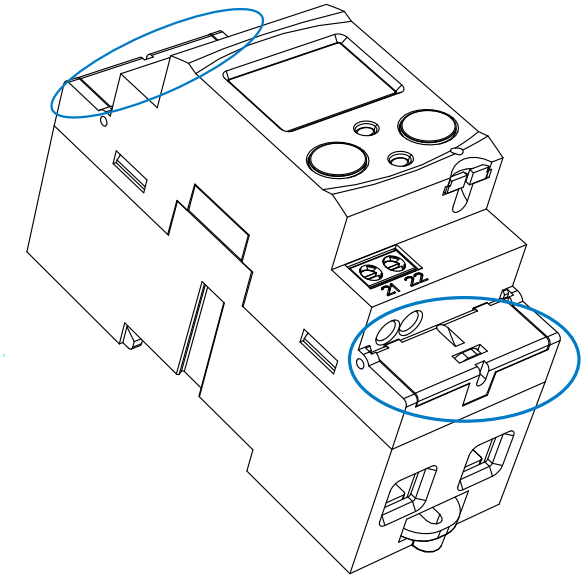


Figure 3: Terminal covers of the CEM-C10.

The fixing screws are of the mixed type, allowing the use of PZ2 and flat head screwdrivers.

Table 3: CEM-C10 connections.

Connections	
Measurement terminals (1, 3, 4, 6)	
Maximum cable cross-section	25 mm^2 (16 mm^2 with end sleeve) ≤ 1.7 Nm
Screwdrivers head	flat head (1.2 x 6.0 mm) or PH2
Impulse output terminals (21, 22)	
Maximum cable cross-section	1.5 mm^2 (1.5 mm^2 with end sleeve) ≤ 0.6 Nm
Screwdrivers head	flat head (3 x 0.5 mm)

Once connected, the unit can be protected with two connection seals (**Figure 4**).

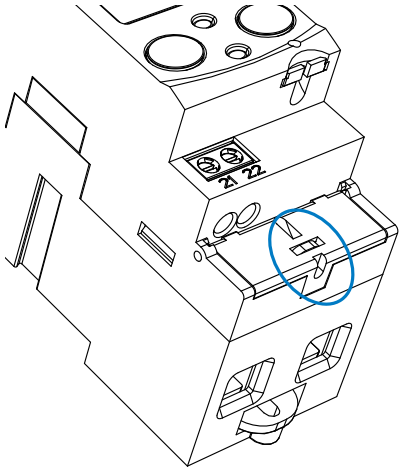


Figure 4: Seal of the CEM-C10.

4.- OPERATION

The **CEM-C10** is an energy meter capable of measuring:

- ✓ Imported and exported active energy and reactive energy in the four quadrants. (according to version).
- ✓ Active and reactive power (according to version).
- ✓ RMS voltage and current
- ✓ Power factor, PF

4.1.- KEYBOARD FUNCTIONS

The **CEM-C10** has 1 key that allows you to browse the different screens and configure the unit.

Key functions on the measuring screens (**Table 4**):

Table 4: Keys functions on measuring screens.

Key	Short press	Long press (> 2 s)
	For the cyclic movement. Next screen.	Enters reading mode.
	No function.	

4.2.- DISPLAY

The unit has an LCD where all parameters are displayed.

The display is divided into three areas (**Figure 5**):

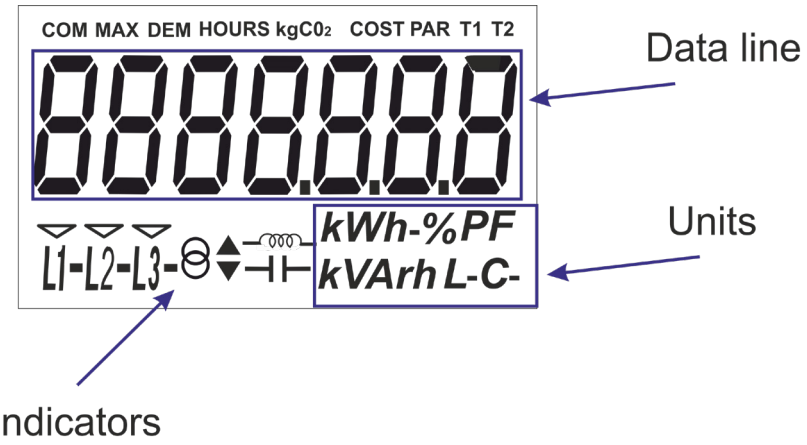


Figure 5: CEM-C10 Display areas

- ✓ **Data line,** displaying the values measured by the unit.
- ✓**Units,** where the unit of the magnitude being viewed is shown.

✓**Indicators,** which shows other parameters:

Indicates that the energy being viewed is generated.
Indicates that the energy being viewed is consumed.
Indicates that the energy is inductive.
Indicates that the energy is capacitive.

COM, indicates that there is a communications module connected. It flashes when the communications are established.

L1 - L2 - L3 - Indicates the presence of voltage in each phase, with its corresponding current direction:

" - " is used to show the power yielded to the network.
" " is used to show the power absorbed by the network.

4.3.- LED INDICATORS

The unit has two verification LEDs:

✓ To verify the **active energy.**
✓ To verify the **reactive energy** (according to version).

The weight of the LEDs is 1,000 imp/kWh(kvarh).

The LEDs will remain lit when the current lower than the energy meter start-up current. Once the start-up current is exceeded (due to active or reactive power consumption) the LEDs are turned off and emit impulses that are proportional to the measured energy.

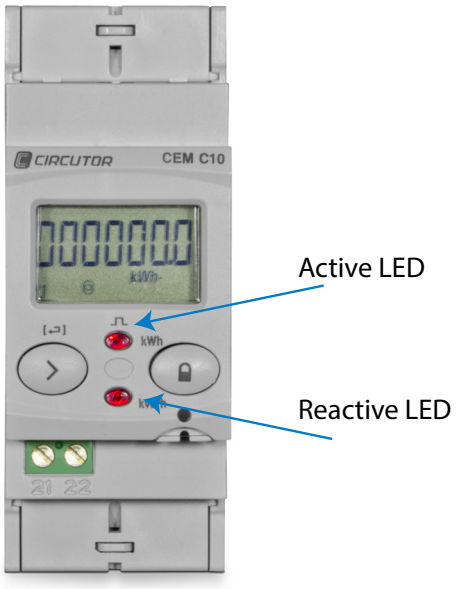


Figure 6:LED Indicators of the CEM-C10.

4.4.- DISPLAY MODES

The **CEM-C10** has 2 display modes:

- ✓Standby mode display
- ✓Reading mode display

4.4.1. STANDBY MODE DISPLAY

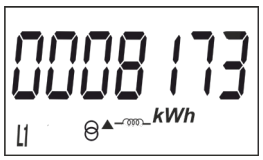
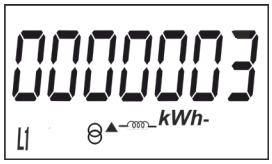
With the display in standby mode, all of the information is presented in cyclic form without any need to perform any action on the **CEM-C10** keyboard.

Six different parameters are viewed in this mode, see **Table 5**, in which they alternate every 6 seconds.

The unit is in this mode by default when none of the keys are pressed.

Short press the key to stop the cyclic movement of the parameter being shown at the time. From then on, short press the key to browse all the parameters defined in **Table 5**.

Table 5: Standby mode displays

Screen	Parameters
	Total imported active energy
	Total exported active energy *Only displayed in the 4-quadrant version.*
	Reactive energy quadrant L+ total (1)
	Reactive energy quadrant L- total (1) *Only displayed in the 4-quadrant version.*
	Reactive energy quadrant C- total (1) *Only displayed in the 4-quadrant version.*
	Reactive energy quadrant C+ total (1)

(1) Only displayed if the reactive energy display option has been selected in the setup menu. (see ***"4.7.6. Display"***).

The standby mode is activated again when no key is pressed for 60 seconds.

4.4.2. READING MODE DISPLAY

The reading mode is activated by a long press on the key.
In reading mode you can:

- ✓ View the voltage, current, active power, apparent power and power factor of the installation.
- ✓ View the energies of the partial energy meters.
- ✓ Enter the programming menu.
- ✓ View the manufacturer information.

The navigation diagram is shown in **Figure 7**:

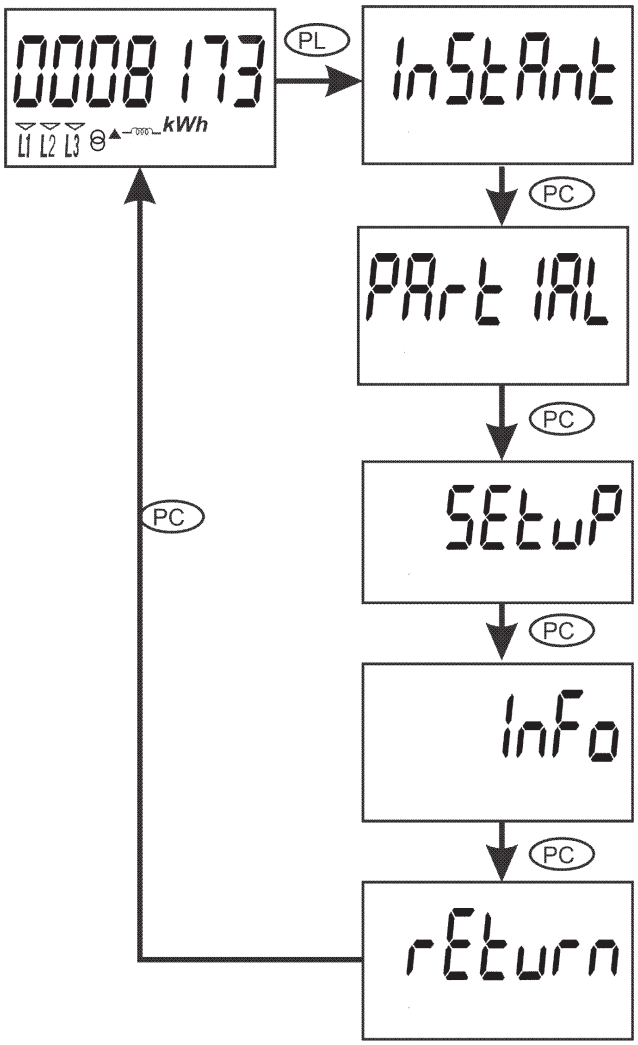


Figure 7: Navigation diagram in reading mode of the CEM-C10.

Note: **PC** is a short press on the key (< 2 seconds).
PL is a long press (> 2 seconds).

4.5.- INSTANTANEOUS VALUE DISPLAY

To open the screens where the instantaneous value are viewed, long press the key on the display in standby mode.
The home screen is displayed **Figure 8**:

Figure 8: Instantaneous Value main screen.

Long press the key to open the different screens.
Short press the key to browse the different screens (see **Table 6**).
The standby mode is activated again when no key is pressed for 60 seconds.

Table 6: Instantaneous value screens

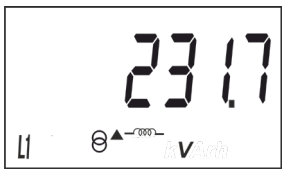
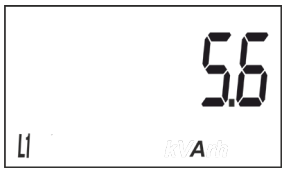
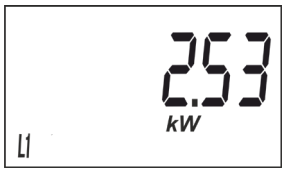
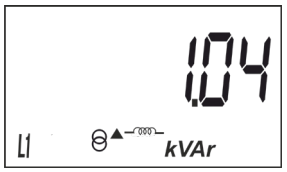
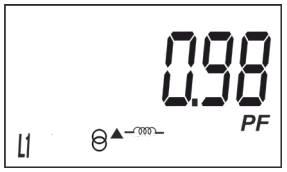
Screen	Parameters
	Voltage
	Current
	Active power
	Reactive power
	Apparent power
	Power factor

Table 6 (Continuation): Instantaneous value screens

Screen	Parameters
	Hours of operation from manufacture

4.6.- PARTIAL ENERGY DISPLAY

Note: *The partial energy display menu is only displayed if the partial energy display option has been selected in the setup menu* (see ***"4.7.6. Display"***).

Long press the key in the standby mode screen to open these display screens. Short press the key to display the partial energy main screen, **Figure 9**:

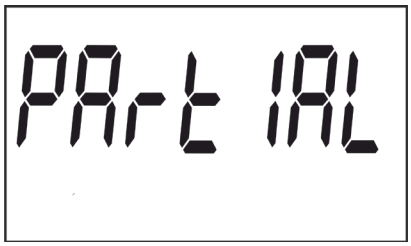


Figure 9: Partial energy main screen.

Long press the key to open the different screens.
Short press the key to browse the different screens (see **Table 7**).

The **PAR** icon on the screen indicates that you are viewing the partial energies.
The standby mode is activated again when no key is pressed for 60 seconds.

Table 7:Partial energy screens.

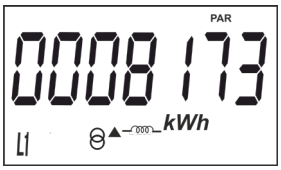
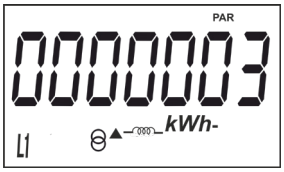
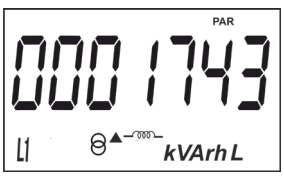
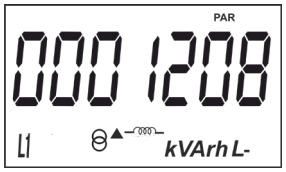
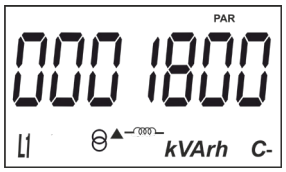
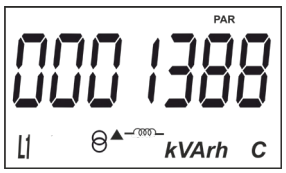
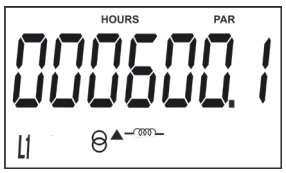
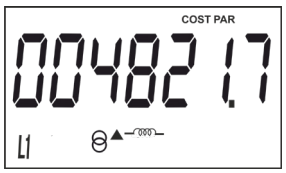
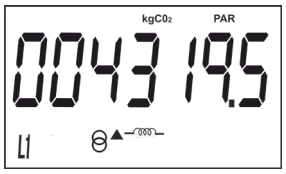
Screen	Parameters
	Partial imported active energy.
	Partial exported active energy. *Only displayed in the 4-quadrant version.*
	Partial reactive energy, quadrant 1 (L+). (2)

Table 7 (Continuation): Partial energy screens.

Screen	Parameters
	Partial reactive energy, quadrant 2 (L-). (2) *Only displayed in the 4-quadrant version.*
	Partial reactive energy, quadrant 3 (C-) (2) *Only displayed in the 4-quadrant version.*
	Partial reactive energy, quadrant 4 (C+) (2)
	Hours in partial operation (since the last partial reset)
	Cost of the partial active energy consumed (since the last partial reset) (3)
	CO_2 emissions into the atmosphere. (since the last partial reset) (3)

(2) Only displayed if the reactive energy display option has been selected in the setup menu (see ***"4.7.6. Display"***).

(3) Only displayed if the efficiency factors display option has been selected in the setup menu (see ***"4.7.6. Display"***).

4.7.- CONFIGURATION

In the setup menu you can:

- ✓ Program the weight and type of impulse output.
- ✓ Program the communications.
- ✓ Program the display screen.
- ✓ Program the cost of the energy and the CO_2 emissions
- ✓ Delete the partial energy meters.

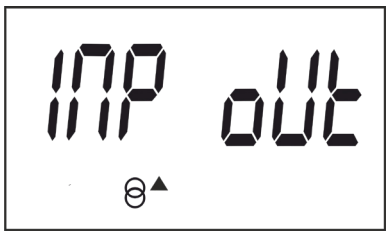
The standby mode is activated again when no key is pressed for 60 seconds.

Long press the key in the standby mode screen to open these setup screens. Short press the key to display the home screen, **Figure 10**:

Figure 10: Programming home screen

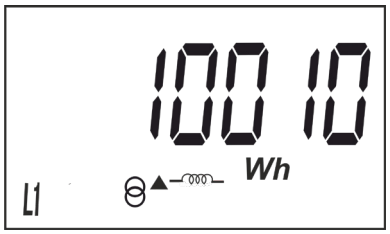
Long press the key to access the first programming step.

4.7.1. Impulse output weight



This is the home screen for entering the weight of the impulse output.

Long press the key to view the value to be programmed.



To write or modify the value, short press the key repeatedly, increasing the value of the flashing digit.

When the desired value is shown on the screen, move onto the next digit with a long press on the key, allowing the remaining values to be modified.

To validate the data, move to the last digit and long press the key; the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

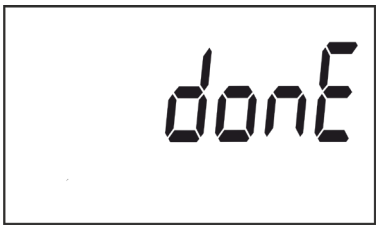


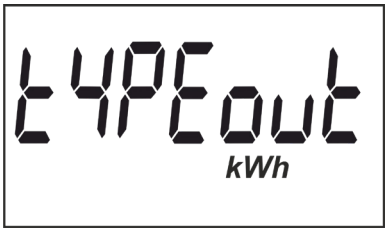
Figure 11: Validation screen.

After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Impulse output weight** programming main screen.

Minimum value: 99999.
Maximum value: 0.

Short press the key to access the next programming step

4.7.2. Impulse output type



The impulse output type is selected on this screen, between: **kWh** or **KVArh.**

Short press the key to browse the different options.

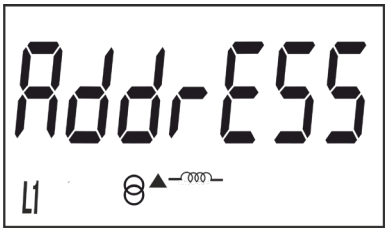
To validate the data, long press the key and the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Impulse output type programming** main screen.

Short press the key to access the next programming step.

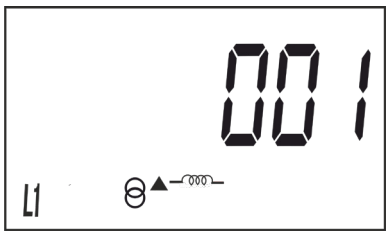
4.7.3. Peripheral address

Note: *This is only displayed if there is a* ***CEM M-RS485*** *(communications interface for the* ***CEM*** *family of units) connected to the unit.*



This is the home screen for entering the peripheral address.

Long press the key to view the value to be programmed.



To write or modify the value, short press the key repeatedly, increasing the value of the flashing digit.

When the desired value is shown on the screen, move onto the next digit with a long press on the key, allowing the remaining values to be modified.

To validate the data, move to the last digit and long press the key; the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

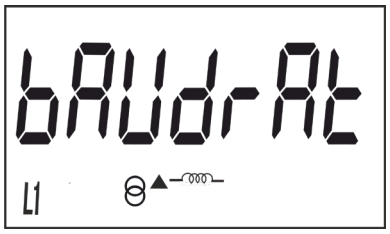
After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Peripheral address** programming main screen.

Minimum value: 1.
Maximum value: 254

Short press the key to access the next programming step

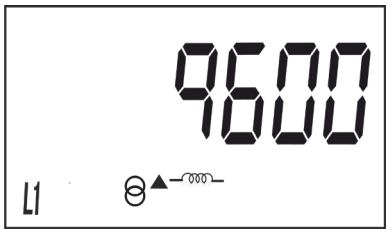
4.7.4. Transmission speed (Baud rate)

Note: *This is only displayed if there is a **CEM M-RS485** (communications interface for the **CEM** family of units) connected to the unit.*



This is the home screen for entering the transmission speed.

Long press the key to view the value to be programmed.



The transmission speed (Baud rate) is selected on this screen, and may be: **9600**, **19200** or **38400.**

Short press the key to browse the different options.

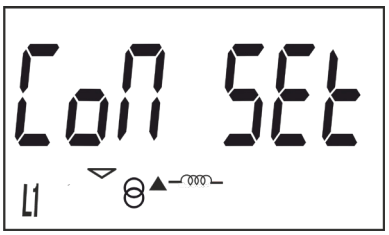
To validate the data, long press the key and the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

After a few seconds viewing the screen shown on **Figure 11**, the system returns to the **Transmission speed** programming main screen.

Short press the key to access the next programming step.

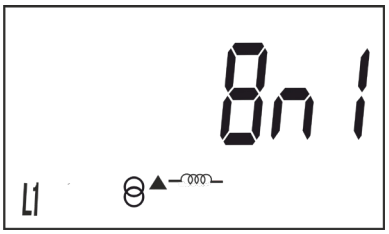
4.7.5. Type of communications

Note: *This is only displayed if there is a* ***CEM M-RS485*** *(communications interface for the* ***CEM*** *family of units) connected to the unit.*



This is the home screen for selecting the number of bits, the parity and the number of stop bits of the communications frame.

Long press the key to view the value to be programmed.



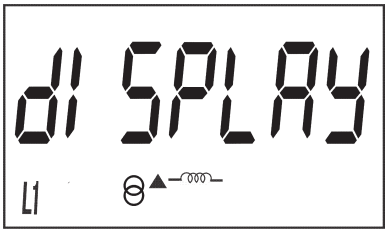
This screen shows the different options:
8n 1 : 8 bits, no parity, 1 stop bit.
8E 1 : 8 bits, even parity, 1 stop bit.
8o 1 : 8 bits, odd parity, 1 stop bit.
8n2 : 8 bits, no parity, 2 stop bits.
8E2 : 8 bits, even parity, 2 stop bits.
8o2 : 8 bits, odd parity, 2 stop bits.

Short press the key to browse the different options.
To validate the data, long press the key and the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Communications type** programming main screen.

Short press the key to access the next programming step.

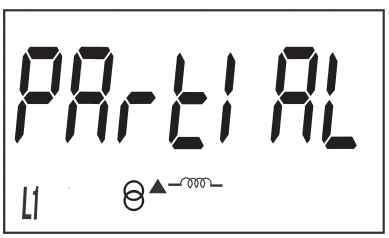
4.7.6. Display



This is the home screen for selecting the unit display options.

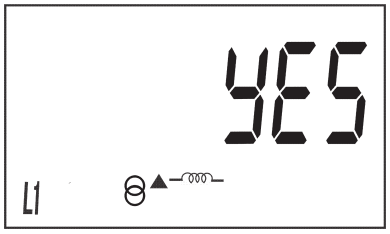
Long press to access the partial energy display selection screen:

4.7.6.1. Partial energy display



This is the home screen for selecting the partial energy display view option.

Long press to view the options.

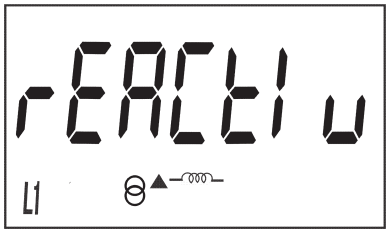


The possible options are:
Yes, if you want to view the partial energy.
No, if you select this option, the unit stops recording the partial energy. A display view is not provided and the value displayed by communications is 0.
Short press the button to browse the different options.

To validate the data, long press the button. The unit will return to the main programming screen of the **Partial energy display**.

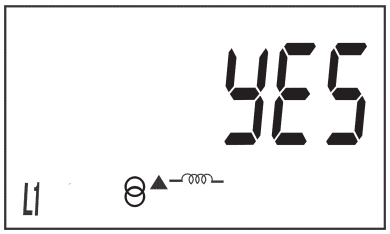
Short press to access the reactive energy display selection screen:

4.7.6.2. Reactive energy display



This is the home screen for selecting the reactive energy log display view option.

Long press to view the options.

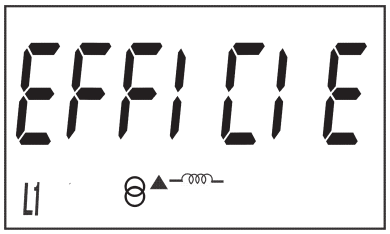


The possible options are:
Yes, if you want a display view of the reactive energy screens.
No, a display view of the reactive energy screens is not provided, but a communications view is possible.
Short press the button to browse the different options.

To validate the data, long press the button. The unit will return to the main programming screen of the **Reactive energy display**.

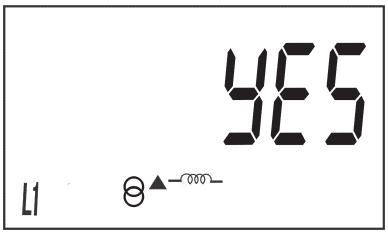
Short press to access the efficiency factors display selection screen:

4.7.6.3. Efficiency factors display



This is the home screen for selecting the display view of the efficiency factors: Cost of energy and CO_2 emissions.

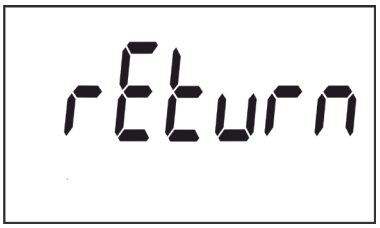
Long press to view the options.



The possible options are:
Yes, if you want a display view of the efficiency screens (cost of energy and CO_2 emissions).
No, if you select this option, the unit stops recording the efficiency factors. A display view is not provided and the value displayed by communications is 0.
Short press the button to browse the different options.

To validate the data, long press the button. The unit will return to the main programming screen of the **Efficiency factors display**.

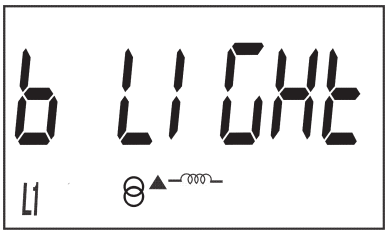
Short press to access the display menu output screen:



When this screen is displayed:
Short press the button to return to the first configuration point of the display (***"4.7.6.1. Partial energy display"***)

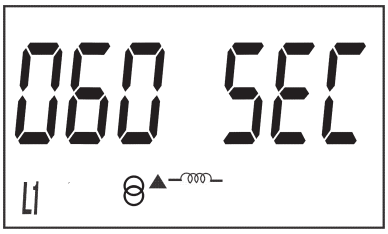
Long press the button to jump to the next programming point.

4.7.7. Backlight



This is the home screen for selecting the backlight operating mode of the screen in those units that feature it.

Long press to view the different options:



This screen shows the different options:
On : Backlight always ON.
OFF : Backlight always OFF.
005 SEC ... 120 SEC: ON time after the last press of the buttons.

Short press the button to browse the different options.
To validate the data, long press the button and the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

After a few seconds viewing the screen shown in **Figure 11** , it returns to the main programming screen of the **Backlight**.

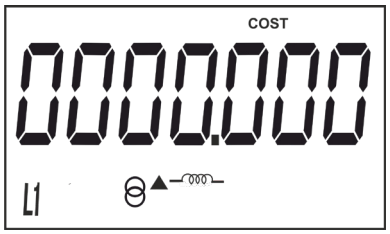
Short press the .button to access the next programming step.

4.7.8. Energy cost

Note: *It is only displayed if the efficiency factors display has been selected.*

This is the home screen for entering the energy cost per kWh.

Long press the key to view the value to be programmed.



To write or modify the value, short press the key repeatedly, increasing the value of the flashing digit.

When the desired value is shown on the screen, move onto the next digit with a long press on the key, allowing the remaining values to be modified.

To validate the data, move to the last digit and long press the key; the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

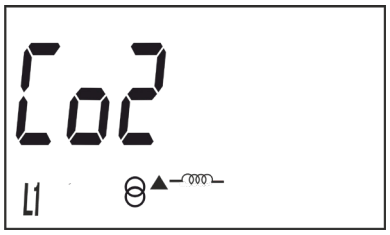
After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Energy cost** programming main screen.

Minimum value: 0.000
Maximum value: 9999.999

Short press the key to access the next programming step.

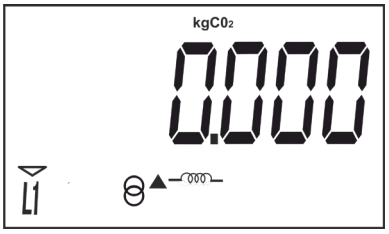
4.7.9. CO_2 emissions

Note: *It is only displayed if the efficiency factors display has been selected.*



This is the home screen for entering the ratio of the carbon emissions. The carbon emissions ratio is the amount of emissions released into the atmosphere to produce a unit of electricity (1 kWh).
The European mix ratio is approximately 0.65 $kgCo_2$ per kWh.

Long press the key to view the value to be programmed.



To write or modify the value, short press the key repeatedly, increasing the value of the flashing digit.

When the desired value is shown on the screen, move onto the next digit with a long press on the key, allowing the remaining values to be modified.

To validate the data, move to the last digit and long press the key; the validation screen will appear (**Figure 11**) indicating that the programming value has been saved.

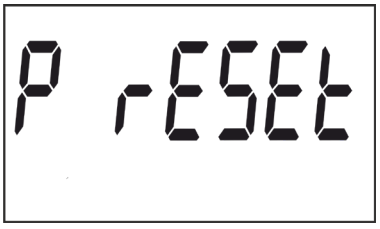
After a few seconds viewing the screen shown on **Figure 111**, the system returns to the **CO_2 emissions** programming main screen.

Minimum value: 0.000
Maximum value: 9.000

Short press the key to access the next programming step.

4.7.10. Deleting the partial energy meters

Note: *It is only displayed if the partial energy display has been selected.*

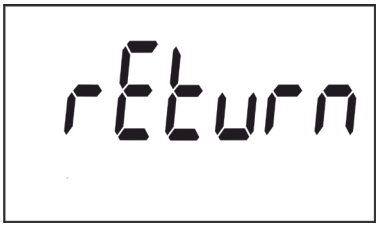


On this screen you select whether or not to delete the partial energy meters.

Long press the key to delete the energy meters. The validation screen (**Figure 11**) will be displayed next, indicating that the energy meters were deleted correctly.

After a few seconds viewing the screen shown on **Figure 11** , the system returns to the **Partial energy meter deletion** programming main screen.

4.7.11. Exiting the setup menu



When this screen is displayed:

Long press the key to exit the setup menu.

Short press the key to return to the first setup point (***"4.7.1. Impulse output weight"***).

4.8.- MANUFACTURER INFORMATION SCREEN

Long press the key in the standby mode screen to open these display screens. Short press the key to display the manufacturer information home screen, **Figure 12**:

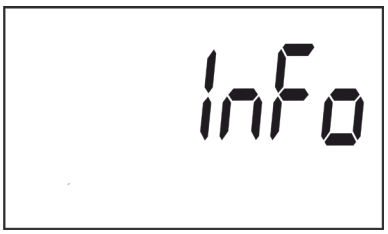


Figure 12: Manufacturer information home screen.

Long press the key to open the different screens.
Short press the key to browse the different screens (see **Table 8**).
The standby mode is activated again when no key is pressed for 60 seconds.

Table 8: Manufacturer information screens.

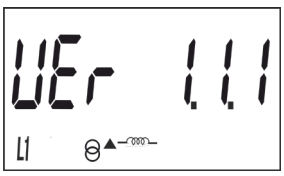
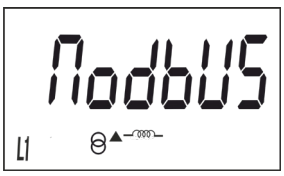
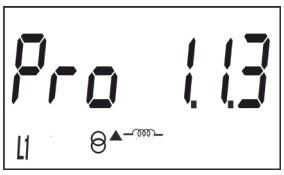
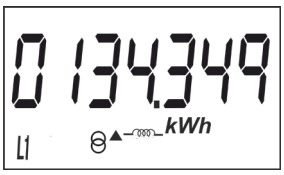
Screen	Parameters
	Unit model
	Version
	Communications protocol[4]
	Communications protocol version [4]
	Active energy with resolution in Wh
	Reactive energy with resolution varh

Table 8 (Configuration): Manufacturer information screens.

Screen	Parameters
	32-bit CRC (high and low-order)

(4) The screen is displayed if there is a **CEM M-RS485** (communications interface for units of the **CEM** family) connected to the unit.

4.9.- IMPULSE OUTPUT

The energy meter has optocoupler type outputs capable of generating impulses at a previously programmed rate. (See ***"4.7.1. Impulse output weight"*** and ***"4.7.2. Impulse output type"***)

4.10.- INFRARED COMMUNICATIONS PORT.

In all versions, the unit has a serial optical communications port, in compliance with the UNE EN 62056-21:2003 Standard.

5.- TECHNICAL FEATURES

Power supply	
Mode	Self-powered
Rated voltage	230 V or 127 V ~ according to version
Tolerance	± 20 %
Frequency	50...60 Hz
Consumption	< 2 W < 10VA (In, Vref (without auxiliary services))

Voltage Measurement	
Connection	Single-phase
Reference voltages	230 V or 127 V ~ according to version
Frequency	50 or 60Hz
Self-consumption of the voltage circuit	< 2 W < 10VA (In, Vref (without auxiliary services))

Current measurement				
	S7		S4	
Current (Ib / Iref)	5 A		10 A	
Maximum current (Imax)	65A		60 A	
Starting current	< 0.1% of In		< 0.1% of In	
Self-consumption of the current circuit	0.3 VA @ 10 A		0.3 VA @ 10 A	
Itr	0.500 A		1.000 A	
Ist	0.020 A		0.040 A	
Imin	0.250 A		0.500 A	
Maximum overcurrent time (30xImax) (according to EN-50470-3)	50Hz	60Hz	50Hz	60Hz
	10 ms	8 ms	10 ms	8 ms

Accuracy		
Active Energy	CEM-C10 MID	CEM-C10
	Class B (EN 50470)	Class 1 (IEC 62053-21)
Reactive Energy	Class 2.0 (IEC 62053-23)	

Insulation	
Alternating voltage	4kV RMS 50Hz during 1 minute

Over pulse	
1.2/50ms OR source impedance	6 kV at 60° and 240°, with positive and negative polarization

Calculation and processing	
Microprocessor	16-bit RISC
AD converter	16-bit

Impulse output		
Type	Optocoupler	
Operation	Emission of impulses proportional to the energy	
Electrical features	Max. 24V ⎓ 50mA	
Impulse ON time	CEM-C10 MID	CEM-C10
	40 ms	200 ms
No. of maximum impulses per second	12	

IR port (service port)	
Hardware	EN62056-21
Protocol	Modbus
Baud rate	9600
Stop bits	1
Parity	no parity

User interface	
Display	LCD
Maximum counter value	999999.9 kWh
Keys	2 keys
LED	2 LEDs: k**Wh**, 1000 imp/kWh k**varh**, 1000 imp/kvarh

Environmental features	
Operating temperature	-25°C... +70°C
Storage temperature	-35°C... +80°C
Relative humidity (non-condensing)	5 ... 95%
Maximum altitude	2,000 m

Mechanical features	
Dimensions (Figure 13)	IEC60715
Weight	140 g
Enclosure	EN50022
Protection degree	IP 51 installed IP40 in terminal area

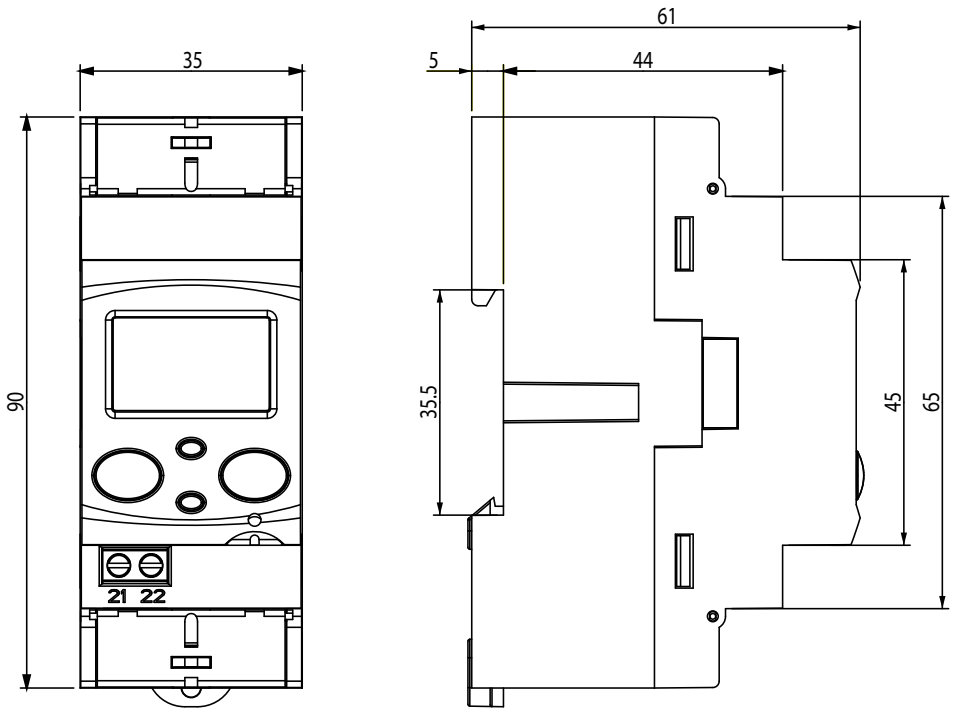


Figure 13: Dimensions of the CEM-C10.

Standards	
Electrical energy metering equipment (AC). Part 1: General requirements, tests and test conditions. Metering equipment (indexes of classes A, B and C)	UNE EN 50470-1:2007
Electrical energy metering equipment (AC). Part 3: Particular requirements. Static active energy meters (classification indexes A, B and C).	UNE EN 50470-3:2007
Electrical energy metering equipment (AC). Particular requirements. Part 21: Static active energy meters (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

6.- MAINTENANCE AND 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

7.- 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.

CIRCUTOR, SA – Vial Sant Jordi, s/n
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(ES) DECLARACIÓN CONFORMIDAD CE

Por la presente **CIRCUTOR, SA** con dirección en **Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) España**, declaramos bajo nuestra responsabilidad que el

Producto:

Contadores de energía monofásicos con módulo comunicaciones

Serie:

CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH

Marca:

CIRCUTOR

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, Cumple con las prescripciones de la(s) Directiva(s):

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

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

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

Año de marcado "CE":

2014

(EN) CE DECLARATION OF CONFORMITY

We hereby **CIRCUTOR, SA** With address in **Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spain**, we declare under our responsibility that the

Product:

Single-phase energy meters with communication module

Series:

CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH

Brand:

CIRCUTOR

Provided that it is installed, maintained and used in application for which it was made, in accordance with relevant installation standards and manufacturer's instructions,, Complies with the provisions of Directive(s):

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

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

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

Year of affixing "CE" marking:

2014

(FR) DECLARATION DE CONFORMITE CE

Par le présent **CIRCUTOR, SA** avec adresse à **Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Epagne**, nous déclarons sous notre responsabilité que le

Produit:

mesureurs d'énergie monophasés avec module comunication

Série:

CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH

Marque:

CIRCUTOR

Toujours qu'il soit installé, maintenu et utilisé pour l'application par lequelle il a été fabriqué, d'accord avec les normes d'installation 1plicables et suivant les instructions du fabricant,, Accomplie avec les prescriptions de la (les) Directive(s):

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

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

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

An de mise en application du marquage "CE":

2014

General Manager: Ferran Gil Torné
10/01/2017

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DE DECLARACIÓN CONFORMIDAD CE

Das Unternehmen CIRCUTOR, S.A., mit Sitz in
Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spanien,
erklärt hiermit eigenverantwortlich, dass das

Produkt:

Einphasen-Energiezähler und Kommunikationmodule

Serie:

**CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH**

Marke:

CIRCUTOR

– sofern es gemäß den geltenden Installationsnormen und den Herstelleranweisungen zu dem vorgesehenen Zweck installiert, gewartet und verwendet wird – den Vorschriften der Richtlinie(n):

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

entspricht und folgende Norm(en) oder anderen einschlägige Dokumente erfüllt:

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

Jahr der CE-Kennzeichnung:

2014

PT DECLARAÇÃO DE CONFORMIDADE CE

Pela presente **CIRCUTOR, SA** com a seguinte morada
Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spain,
declaramos sob nossa responsabilidade que o

Producto:

Contadores de energía monofásicos e modulo de comunicação

Série:

**CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH**

Marca:

CIRCUTOR

Sempre que seja instalado, intervencionado e utilizado na aplicação para a qual tenha sido fabricado, de acordo com as normas de instalação aplicáveis e as instruções do fabricante, cumpre com as prescrições das Directiva(s):

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

Está em conformidade com as seguintes normas ou outros documentos normativo(s) :

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

Ano de marcação "CE":

2014

IT DICHIARAZIONE DI CONFORMITÀ UE

con la presente **CIRCUTOR, SA** con indirizzo in
Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) España,
Dichiariamo sotto la nostra responsabilità che il

prodotto:

Contatori di energia monofase con modulo comunicazioni

Serie:

**CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH**

MARCHIO:

CIRCUTOR

A condizione che sia installato mantenuto e utilizzato nelle applicazioni per cui è stato realizzato, in accordo con le corrispondenti norme di installazione e le istruzioni d'uso del fabricante, L'oggetto della dichiarazione di cui sopra è conforme alla pertinente normativa di armonizzazione dell'Unione:

2014/32/CE: Measuring Instrument Directive R . D . 1 1 1 0 / 2 0 1 3

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

Riferimento alle pertinenti norme armonizzate utilizzate o riferimenti alle altre specifiche tecniche in relazione alle quali è dichiarata la conformità:

IEC 61000-6-3:2007
EN 50470-1:2006 EN 50470-3:2006
IEC 62053-21:2003 IEC 62053-23:2003
IEC 61010-1:2010 IEC 61000-6-2:2005

Anno di apposizione della marcatura CE

2014

General Manager: Ferran Gil Torné
10/01/2017

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(PL)

Deklaracja Zgodności CE

Niniejszym CIRCUTOR, SA z siedzibą w
Vial Sant Jordi, s/n – 08232 Viladecavalls (Barcelona) Spain.
Deklarujemy z pełną odpowiedzialnością. że t...

produk:

Jednofazowe liczniki energii i Moduły komunikacyjne

Seria:

CEM-C10-212, CEM-C10-212 MID +
CEM M-RS-485, CEM-M-ETH

marka:

CIRCUTOR

Pod warunkiem, że jest zainstalowany, utrzymany i używany zgodnie z przeznaczeniem w nawiązaniu do odpowiednich norm, standardów i instrukcji producenta. Zgodne z dyrektywą

2014/32/CE: Measuring Instrument Directive	R . D . 1 1 1 0 / 2 0 1 3
2014/35/UE: Low Voltage Directive	2014/30/UE: Electromagnetic Compatibility Directive

Jest zgodny z obowiązującymi standardami lub innym dokumentem normatywnym

IEC 61000-6-3:2007	
EN 50470-1:2006	EN 50470-3:2006
IEC 62053-21:2003	IEC 62053-23:2003
IEC 61010-1:2010	IEC 61000-6-2:2005

Rok nadania znaku CE

2014

General Manager: Ferran Gil Torné
10/01/2017

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