# EU-TYPE EXAMINATION CERTIFICATE

0402-MID- SC0781-18

# Active electrical energy meter CEMP

*Issued to*

## Corroventa Avfuktning AB

Mekanikervägen 3, SE 564 35 Bankeryd, Sweden,

The product is fulfilling module B (Annex II) of directive 2014/32/EU on measuring instruments (MID), implemented in Swedish law by SWEDAC (The Swedish Board for Accreditation and Conformity Assessment) through STAFS 2016:1 The Measuring Instruments Regulations and STAFS 2016:4 The Regulations and Guidelines concerning active electrical meters. Rise Certification Rule SPCR 302 has been applied.

**Applicable essential requirements of directive 2014/32/EU**

- Annex I, Essential requirements
- Annex V (MI-003), Active electrical energy meters

**Harmonised standards and normative documents used**

SS EN 50470-1 Electricity metering equipment (a.c.) Part 1: General requirements, tests and test conditions – Metering equipment (class indexes A, B and C), edition 2007
SS EN 50470-3, Electricity metering equipment (a.c.) Part 3: Particular requirements – Static meters for active energy (class indexes A, B and C), edition 2007

**Further applied documents**

WELMEC 7.2, Software Guide (2015)

**Rated operating conditions**

| | | | |
|---|---|---|---|
| Measurand: | Active electrical energy/kWh | Mechanic environment class: | M2 |
| Measurement range: | Reference current 5 A | Electromagnetic environment class: | E2 |
| Accuracy: | Class B | Climatic environment: | -25 to +55 °C<br>Non-condensing<br>Closed |

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The instruments / measuring systems must correspond with the following specifications:

## 1. Design of the instrument

### 1.1 Construction

**Product name**

CEMP. CEMP is an acronym that stands for Corroventa Energy Measurement Platform

**Measuring system description**

The CEMP is an active electrical energy meter for single phase 230VAC, 50 Hz, designed for integration with dehumidifiers and other similar dehumidification and/or ventilation machines, allowing the energy consumption to be measured and displayed to the user. The CEMP is configured with a built-in and already MID-approved meter, the EM111 from Carlo Gavazzi, and a display unit. The MID Energy Meter screen is then a part of the given machine's overall menu system. The energy consumption reading is provided by EM111 through its RS485 ModBus interface and the display unit acts only as a remote screen, presenting the value as it is currently read out, without doing any calculations or providing any data storage services. The basic accuracy requirements are thus met by the certification of the EM111. The part of the display unit software responsible for the MID Energy Meter related functions have been separated in accordance with WELMEC 7.2.

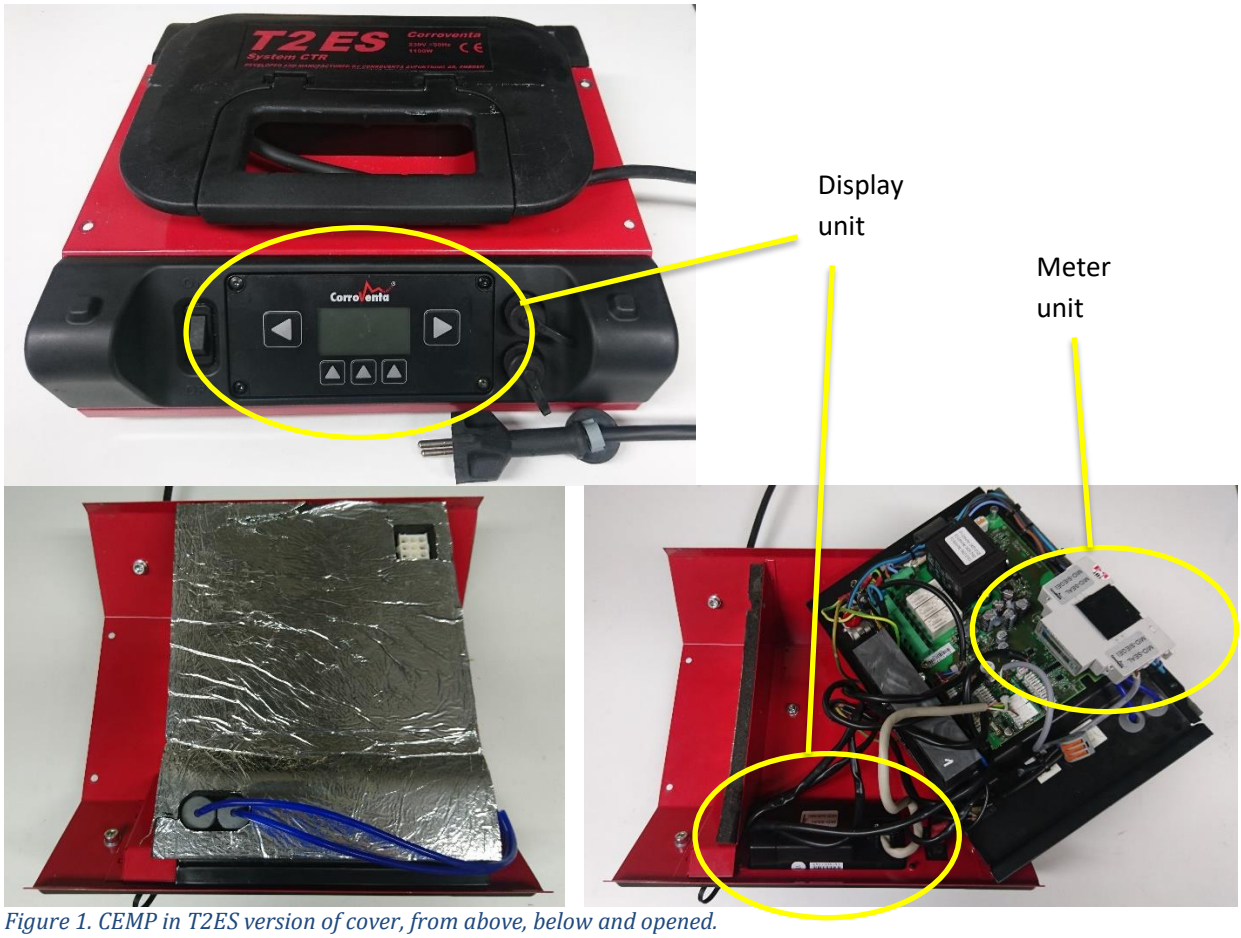



*Figure 1. CEMP in T2ES version of cover, from above, below and opened.*

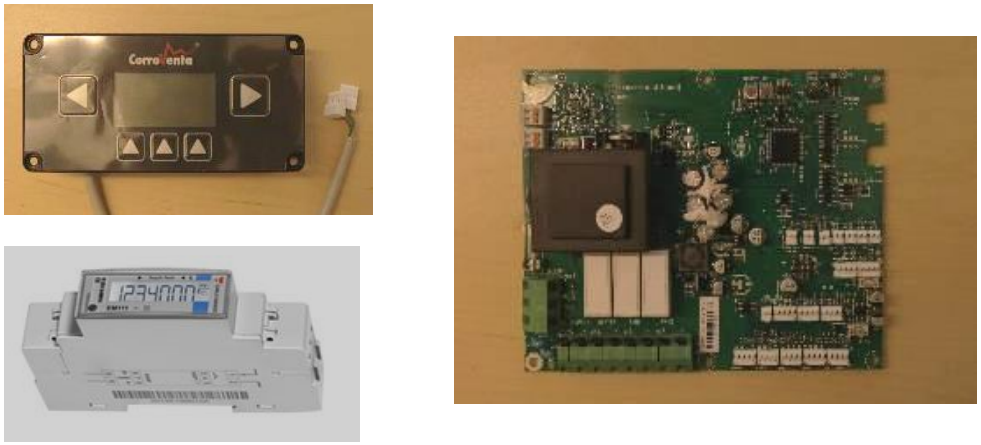


*Figure 2. Display unit, meter unit EM111, and I/O board providing power supply.*

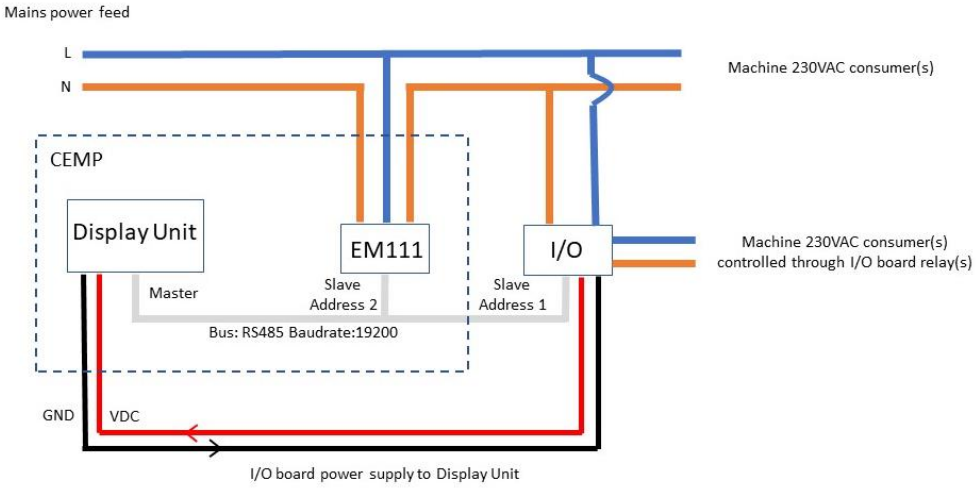



*Figure 3. CEMP Block diagram.*

Influence factors for temperature, frequency and voltage, as of EU type examination certificate for Carlo Gavazzi EM111, issued by SGS, cert. nbr. 0120/SGS0173 issue 6.

| Current | PF/cos | -25 °C | -10 °C | 5 °C | 30 °C | 40 °C | 55 °C |
|---|---|---|---|---|---|---|---|
| $I_{min}$ | 1 | 0.5 | 0.52 | 0.35 | 0.25 | 0.25 | 0.24 |
| $I_{tr}$ | 1 | 0.5 | 0.48 | 0.33 | 0.24 | 0.22 | 0.21 |
| $10I_{tr}$ | 1 | 0.48 | 0.45 | 0.31 | 0.23 | 0.2 | 0.16 |
| $I_{max}$ | 1 | 0.51 | 0.49 | 0.39 | 0.34 | 0.32 | 0.28 |
| $I_{tr}$ | 0.5ind | 0.46 | 0.46 | 0.29 | 0.21 | 0.19 | 0.21 |
| $10I_{tr}$ | 0.5ind | 0.42 | 0.39 | 0.27 | 0.2 | 0.15 | 0.12 |
| $I_{max}$ | 0.5ind | 0.47 | 0.47 | 0.37 | 0.33 | 0.29 | 0.26 |
| $I_{tr}$ | 0.8cap | 0.53 | 0.51 | 0.35 | 0.25 | 0.24 | 0.22 |
| $10I_{tr}$ | 0.8cap | 0.52 | 0.48 | 0.34 | 0.26 | 0.22 | 0.18 |
| $I_{max}$ | 0.8cap | 0.55 | 0.52 | 0.42 | 0.37 | 0.34 | 0.31 |

### 1.2 Software

The software of the Carlo Gavazzi EM111 meter is covered by its own EU type examination certificate and is not assessed here.

The validation of the CEMP display and communication software was based on the essential requirements given in MID and WELMEC Guide 7.2.

**Software version**

The following program versions are approved:

| Type of program | Program version | Checksum |
|---|---|---|
| Display and communication firmware | 1.0 | AB2D651A |

The versions can be displayed by pressing either of the upper arrow buttons on the display unit repeatedly until the "MID Energy meter" menu is displayed.

### 1.3 Components included for electronic function

For the general description see 1.1 and 1.2 above. The included Carlo Gavazzi EM111 meter is fully responsible for all energy measurements. The display unit contain the display and the data communication and data handling processor. This display and processor are shared with the de-humification control software, but the measurement software is separated.

### 1.4 Optional equipment and functions subject to MID requirements

None identified

### 1.5 Technical documentation

The included Carlo Gavazzi EM111 meter details are described in its own EU type examination certificate. The CEMP construction, software and included components are described in 1.1, 1.2 and 1.3 of this document, and its use is described in the user's manual for the different versions of de-humification equipment.
Assessed manual: User Manual CTR T ES, version 2018.11c

### 1.6 Integrated equipment and functions not subject to MID

See 1.1-1.3 of this document

## 2. Technical data

### 2.1 Rated operating conditions

**Measurand**

Active electrical energy (kWh)

**Measurement range**

Current

| | |
|---|---|
| $I_{st}$ | 0.02A |
| $I_{min}$ | 0.25A |
| $I_{tr}$ | 0.5A |
| $I_{ref}$ | 5A |
| $I_{max}$ | 45A* |

Power factor 0.5ind. to 0.8cap.
Maximum energy registered 9 999 999,9 kWh
* Energy metering current capacity, otherwise limited to 16 A.

**Accuracy**

Class B

**Operating conditions/influence factors**
Voltage 230VAC
Frequency 50 Hz

**Environments classes / influence quantities**

| | |
|---|---|
| Mechanic: | class M2 |
| Electromagnetic: | class E2 |
| Ambient temperature limits: | -25°C to +55°C |
| Humidity: | Non condensing |
| Location: | closed |

**2.2 Other operating conditions**
None identified

**3. Interfaces and compatibility conditions**
None identified

**4. Requirements on production, putting into use and utilisation**

**4.1 Requirements on production**
No special requirements identified.

**4.2 Requirements on putting into use**
No special requirements identified.

**4.3 Requirements for consistent utilisation**
No special requirements identified.

**5. Control of the measuring tasks of the instrument in use**

**5.1 Documentation of the procedure**
Control of the measuring tasks can be done by comparison with reference instrument using the normal load of de-humidifier, preferable operating at full capacity with all power consuming functions activated.

**5.2 Special equipment or software, if applicable**
Test output (LED) not provided without disassembly. Watt meter with integration function can be used as reference. Extra decimal of resolution provided by 0,01 kWh only with disassembly.

Voltage and current circuits can not be disconnected from each other.

**5.3 Calibration-/adjustment procedure**
No special requirements identified.

**6. Security measures**

**6.1 Sealing**
The embedded Carlo Gavazzi MID meter has its own seals. In addition, the integrity of the CEMP display and communication bus are protected by security labels that will separate and leave visible trace if anyone attempts to remove them or to manipulate the device. The labels, that have a Corroventa label and “MID seal” printed on them in English and German, are applied to the EM111 terminal covers and to the Control Panel USB cover as depicted below.

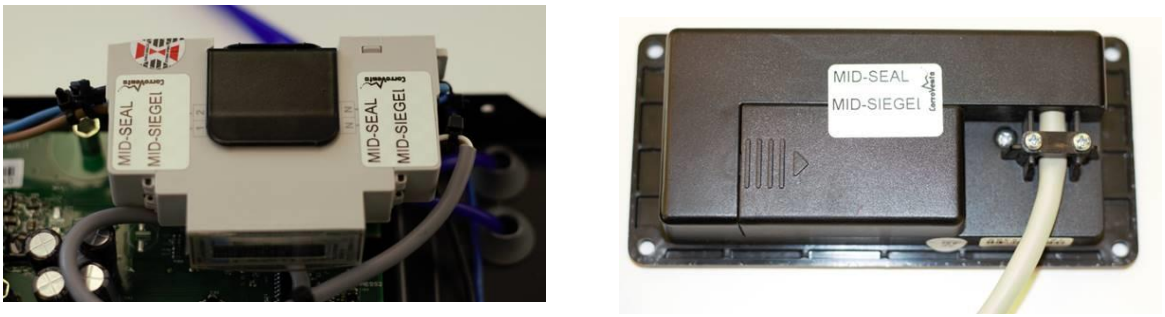


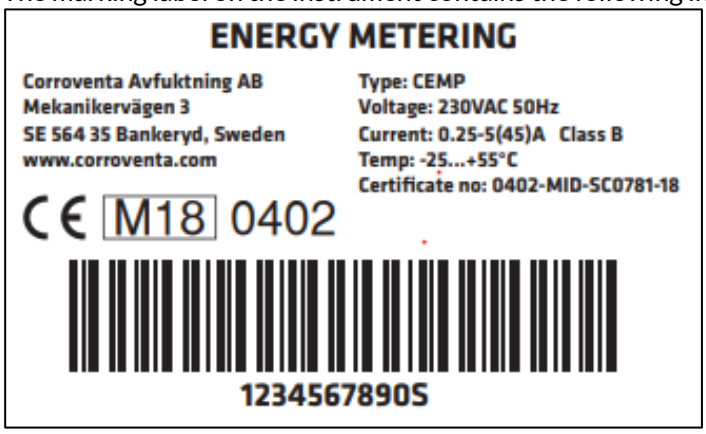

*Figure 4. Placement of CEMP seals, on terminal cover of meter and the display case*

The seals described are mounted identically on all CEMP configured machines. The dimensions and the shapes of the overall electronics compartments in which the CEMP is integrated differ from machine to machine but are exemplified by the T2ES configuration in Figure 1 .

### 6.2 Data logger
Not applicable.

## 7. Labelling and inscriptions

### 7.1 Information to be borne by the instrument
The marking label on the instrument contains the following information:




### 7.2 Conformity marking in accordance to MID article 21
The instrument is marked in accordance to MID article 21 which e.g. describes the CE-marking together with M, year of marking and the notified body number.

### 7.3 Further inscriptions, if necessary
None identified

## 8. Manuals
The User manual is to accompany the instrument.
Examined manual: User Manual CTR T ES, version 2018.11c, in English

## 9. Testing and examination
Testing and examination have been carried out in accordance with report 8P03991-EvA EC type examination of an active electrical energy meter. The principal characteristics, approval conditions are set out in this certificate.

## 10. Miscellaneous

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## 11. Revision history

| | | |
|---|---|---|
| Issue 1 | 2018-11-30 | Certification of CEMP, first issue |