

**Subject:** GSSM001A – Packing, barcodes and key writing station requirements for Polyphase meters for direct connection supply

**Application Areas**Perimeter: *Brazil and Global*

Staff Function: -

Service Function: -

Business Line: *Enel Grids*

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THE HEAD OF GLOBAL NETWORK DEVICES

**Pilar Nieto Hernández**

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## 1. DOCUMENT AIMS AND APPLICATION AREA

At the end of the production process CEs must be properly packed for transportation. The present document is aimed to completely define the packing of the three phase and bi-phases 3 wires smart meters for direct connection and the characteristics required to guarantee protection of the material during shipment and storing.

The document is applicable for the following countries:

Country	Distribution Company
Brazil	Enel Distribuição Rio Enel Distribuição Ceará Enel Distribuição São Paulo

**Table 1 - Distribution Companies**

*This document shall be implemented and applied to the extent possible within the Enel Grids Srl, Enel Distribuição Rio, Enel Distribuição Ceará, Enel Distribuição São Paulo and in compliance with any applicable laws, regulations and governance rules, including any stock exchange and unbundling-relevant provisions, which in any case prevail over the provisions contained in this document.*

### 1.1 RELATED DOCUMENTS TO BE IMPLEMENTED AT COUNTRY LEVEL

This document doesn't require implementation of further documents.

Anyway, each Enel Grids Company can issue, under the supervision of Enel Grids Global Network Devices, a detailed documents according to the provisions of the present document and in case of specific needs.

## 2. DOCUMENT VERSION MANAGEMENT

Version	Date	Main changes description
1	14/04/2023	Issuing of "GSSM001A – Packing, barcodes and key writing station requirements for Polyphase meters for direct connection supply" Material specification

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### 3. UNITS IN CHARGE OF THE DOCUMENT

Responsible for drawing up the document:

- Enel Grids: Engineering and Construction / Components and Devices Design / Network Devices unit.

Responsible for authorizing the document:

- Enel Grids: Head of Networks Devices unit.
- Enel Grids: Head of Quality unit.

### 4. REFERENCES

- Integrated Policy for Quality, Health and Safety, Environment, anti-Bribery and Information security;
- ISO 9001- Quality Management System – Requirements;
- ISO 14001 - Environmental Management System - Requirements with guidance for use;
- ISO 45001 - Occupational Health and Safety Management System - Requirements with guidance for use;
- ISO 37001 - Anti-bribery Management System - Requirements with guidance for use;
- ISO 27001 - Information Security Management System – Requirements;
- NBR 14519: Electronic electrical energy meters;
- NBR 14520: Electricity electronic meters;
- NBR IEC 60529: Protection degrees provided by enclosures (IP codes);
- NBR 5426: Sampling plans and inspection procedures by attributes;
- INMETRO. INMETRO Ordinance No. 586/2012;
- INMETRO. INMETRO Ordinance No. 587/2012;
- INMETRO. INMETRO Ordinance No. 520/2014;
- INMETRO. INMETRO Ordinance No. 095/2015;
- INMETRO. INMETRO Ordinance No. 221/2022;
- ANEEL Resolution No. 1000/2021 - General Conditions for Electricity Supply;
- PRODIST. Module 5 - Metering Systems and Reading Procedures;

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- NIE-DIMEL-123 - Sealing marks.Notas:
- RACI Handbook Infrastructure and Networks no. 06;
- Policy n.344 - Application of Privacy Regulation within the scope of the Enel Group
- Policy n.243 - Segurança da Informação;
- Policy n.33 – Information, Classification and Protection;
- Policy n.347 - Personal Data Breach Management;
- Policy n.241 - Gestão de Crises e Incidentes Brasil;
- Organizational Procedure 375 - Gestão de Informação Documentada;
- Organizational Procedure n.1626 - Aplicação da Lei Geral de Proteção de Dados Pessoais no âmbito das Empresas do Grupo Enel;
- Operational Instruction 3341 - Gerenciamento de Registro de Tratamento de Dados Pessoais;
- Operational Instruction 3340 - Metodologia para o processo de Avaliação de Impacto na Proteção de Dados;
- GSSMC001: Tests and Test conditions of static meters;
- GSSMC002: Qualification and reliability tests for meters production process validation;
- GSSM001: Poliphase Smart Meter for direct connection.

**Notes:**

- 1) The supplier must make available, for the Enel inspector, at the site of the inspection, all the abovementioned Standards, in their latest revisions.
- 2) The International System of Units (Metric System) must be used for any and all supplies to be carried out.

**Group Pillar References:**

- The Code of Ethics of Enel Group;
- The Enel Group Zero Corruption Tolerance Plan (ZTC);
- Human Rights Policy;
- Organization and Management Model as per Legislative Decree No. 231/2001;
- Enel Global Compliance Program (EGCP).

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## 5. ORGANIZATIONAL PROCESS POSITION IN THE PROCESS TAXONOMY

Value Chain/Process Area: Engineering & Construction

Macro Process: Devices and Components Development

Process: Standard Catalog Management

## 6. DEFINITIONS AND ACRONYMS

Acronym and Key words	Description
Contract Electronic Manufacturer (CEM)	Is a contract to establish the conditions of manufacturer of the EC.
Electronic Meter (CE)	Electronic equipment used in auditing sessions.
European Norm (EN)	European Norm is an expression of requirements for products, processes or services to meet the requirement of fitness for a particular purpose.
European Union (EU)	European Union is a supranational political and economic union of 27 member states that are located primarily in Europe.
Hardware (hw)	Hardware is the set of all the tangible electronic, electrical, mechanical, magnetic, optical parts that allow the operation of a computer.
Height (H)	The distance from the bottom to the top of someone or something standing upright.
International Organisation for Standardisation (ISO)	International Organisation for Standardization is a nongovernmental organization that comprises standards bodies from more than 160 countries, with one standards body representing each member country.
Length (L)	The measurement or extent of something from end to end.
Low Density Poly Ethylene (LDPE)	Low-density polyethylene is a thermoplastic made from the monomer ethylene.
Low voltage concentrator (LVC)	The Low Voltage Concentrator manages the smart meters over the power line network and provides the connectivity infrastructure between meters to the central control.

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Maximum Height ( $H_{max}$ )	The maximum distance from the bottom to the top of someone or something standing upright.
Maximum length ( $L_{max}$ )	The maximum measurement or extent of something from end to end.
Maximum Width ( $W_{max}$ )	The maximum measurement or extent of something from side to side; the lesser of two or the least of three dimensions of a body.
Multiple Packing Unit (MPU)	Multi-unit package means a package containing two or more individually packaged or labelled units of the same food article of identical net quantity, intended and displayed for retail sale either in individual units or package as a whole.
Only Representative (OR)	A natural person or legal entity established physically in the EEA.
Tonne (t)	Tonne = 103 kg
Width (W)	The measurement or extent of something from side to side; the lesser of two or the least of three dimensions of a body.

## 7. PACKING FOR MASS DELIVERY

This document applies to the three phase meters for direct connection and bi-phases 3 wires ones delivered by land (specific requirements are provided when required) internally in Brazil.

### 7.1 PACKING LEVELS

The packing for the electronic meters is subdivided in the following levels:

- Level 0: it is applicable to the single packing
- Level 1: it is applicable to the multiple packing units
- Level 2: it is applicable for the loading units

The following paragraphs describe the main characterises of each level

#### ***Level 0: Single packing***

Packing type: single hot sealed plastic protective bag

Size: suitable to contain the meter (Three phase – biphas 3 wires)

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Indicative gross weight: 2,13 kg (Max)  
Number of meters: 1 per each packing

**Level 1: Multiple packing unit**

Packing type: corrugated paperboard  
Size: such to make manual handling easy, according to the number of meters contained in the box:  
 $W_{max}$ : 320 mm  
 $L_{max}$ : 520 mm  
 $H_{max}$ : 210 mm  
Indicative gross weight: ~9,5 kg  
Colour: Natural paperboard colour  
Number of meters: 4 per packing

**Level 2: Loading unit**

Packing type: LDPE film + packing strap + fitting tools + PBR-I Pallet (for more details see Fig. 1)  
Size: suitable to contain the planned number of multiple packing units:  
W: 1000 mm  
L: 1200 mm  
 $H_{max}$ : 1070 mm (pallet included)  
Indicative net weight<sup>a</sup>: ~205 kg  
Indicative gross weight: ~220÷245 kg (A massa máxima do palete, considerando acrescidos 15% de umidade, é 42 kg.)  
Number of meters: 96 per loading unit  
Number of MPUs: 24 per loading unit

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<sup>a</sup> Includes meters weight only.

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## 7.2 TECHNICAL CHARACTERISTICS OF PACKING FOR MASS DELIVERY

### 7.2.1. GENERAL REQUIREMENTS

The technical characteristics of the packing required at each packing level are de-scribed below.

During the CEs transportation and warehousing the temperature and humidity limits below must not be exceeded:

- Temperature range: -40° C to +70° C
- Humidity range: annual mean <75%  
for 30 days, spread in a natural manner over one year, 95%  
occasionally on other days 85%

In any case, Enel reserves the right to verify the protective efficacy of the planned packing and approve its final implementation.

### 7.2.2. LEVEL 0

Each meter must be packed in a hot sealed plastic envelope (e.g. polyethylene) able to preserve the meter from dust and water infiltration.

The envelope must be transparent and easy to open without using any tool.

A pouch containing a desiccant substance shall be inserted in each envelope in order to absorb humidity: minimum required desiccant quantity in pouches is 1/12 Unit<sup>b</sup>.

The packaging must be attached with a label containing the bar codes (serial) and other information.

### 7.2.3. LEVEL 1

Meters must be put inside multiple packing units, i.e. cardboard boxes, which must be manufactured in compliance to the following statements:

- must contain 4 meters each (partially filled boxes can be applied for justified, documented and strictly limited exceptions only);
- must ensure a proper protection to the meters during transportation and manual handling;
- must guarantee mechanical insulation among the meters inside the box through shell housings, in order to preserve them from mutual shocks during handling;

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<sup>b</sup> Devices such as moisture indicators, tilt indicators, shock indicators, temperature indicators and similar (including substances on their own) shall not be used in the packing of CEs.



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- used materials and design must prevent dispersion of insulation, which must not be made with easy to be wasted materials (e.g. pieces of polystyrene, etc.);
- must allow easy handling (proper weight and size);
- must guarantee the overlapping of level 1 packing on more layers (until the total height of 1070 mm including the pallets) avoiding any possible deformation or damage of boxes and of CEs inside;
- must guarantee the overlapping on two layers at level 2 avoiding any possible deformation or damage of boxes and of CEs inside;
- must guarantee the safe transportation of the meters on pallets also in case of boxes including less than 4 CEs;
- the total weight and size of a full box must be within the limits
- A label containing barcodes (serial) and further information shall be stuck on each box.

**7.2.4. LEVEL 2**

Multiple packing units must be put on "waste type" wooden pallets. The used pallets must have flat size 1000x1200 mm and should be compliant to PBR-1 specifications reported in Fig. 1

CEMs can propose alternative design of waste type pallets:

- flat size 1000x1200;
- maximum load suitable to the net weight of level 2 packing
- allowing easy insertion of standard forks along both axes.

Proposed design must be approved by Enel before use.

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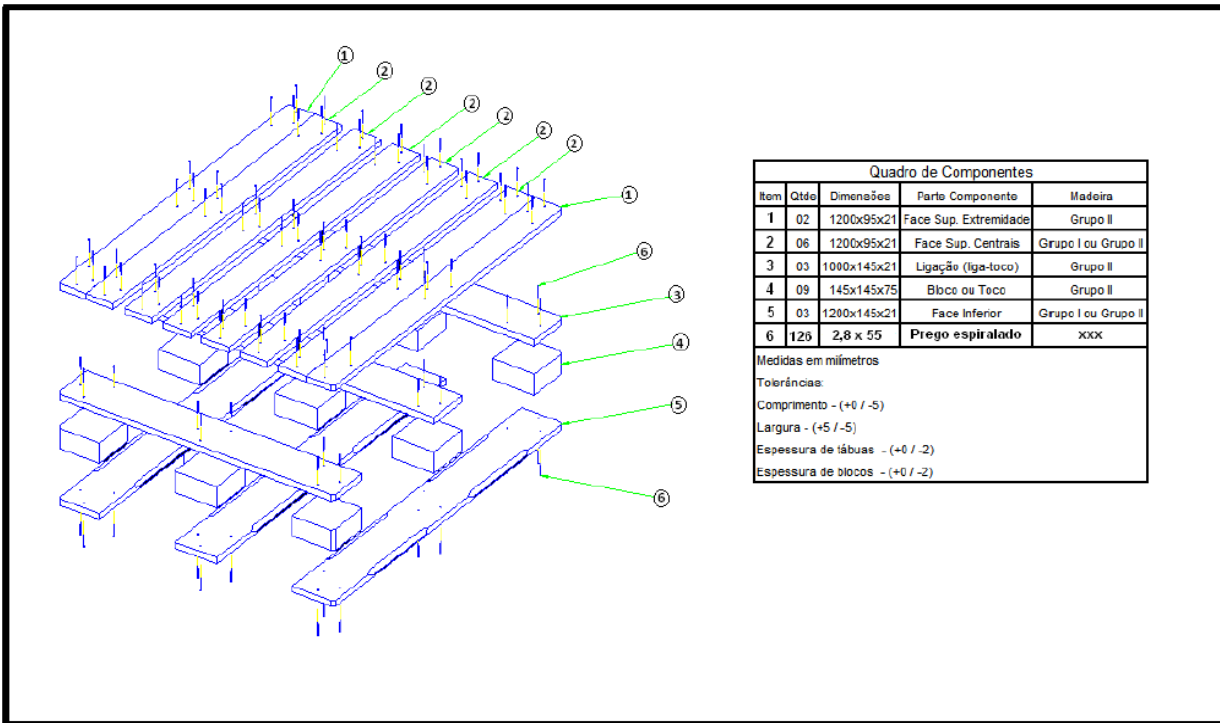
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*Fig. 1 PBR-I wooden pallet specifications*

Each pallet shall collect 4 layers of boxes, each layer including 2 rows of 3 boxes each (see box disposition in fig.2Fig. 2), for a total of 24 boxes (96 CEs) per loading unit.

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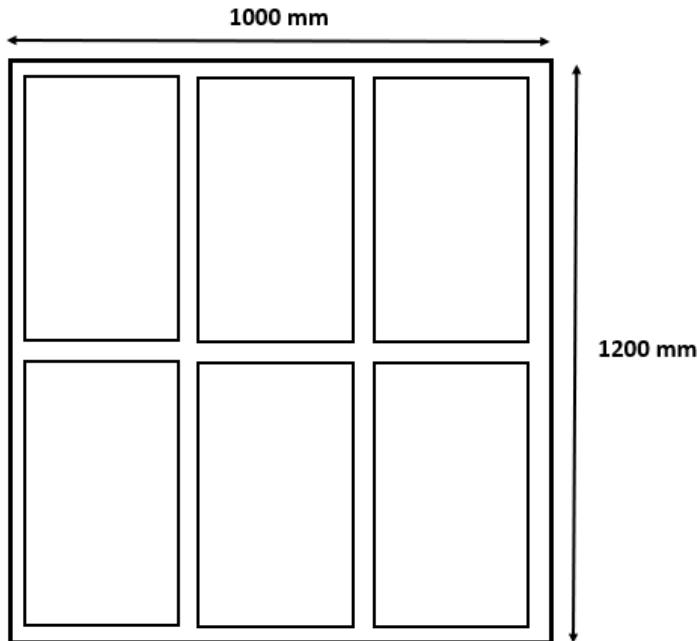
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*Fig. 2 Box disposition on pallet (top view)*

Each loading unit must be compliant to the following statements:

- design must guarantee a proper arrangement and protection of the single boxes to avoid damage both to the boxes and the equipment inside during transportation and handling;
- design of the loading unit must guarantee the perfect load stability during transportation and handling (stability of loading unit must be guaranteed also in case of partial collection of material);
- number of boxes collected on loading units should always be 24 (i.e. 96 CEs), but for justified, documented and strictly limited exceptions;
- loading units must allow overlapping, during transportation and warehousing, of an-other similar loading unit (1+1 stacking), avoiding damages and/or deformations to the loading unit below, the single boxes and the meters inside the boxes;
- the maximum height of the loading unit, including the wooden pallet, must not exceed 1070 mm;

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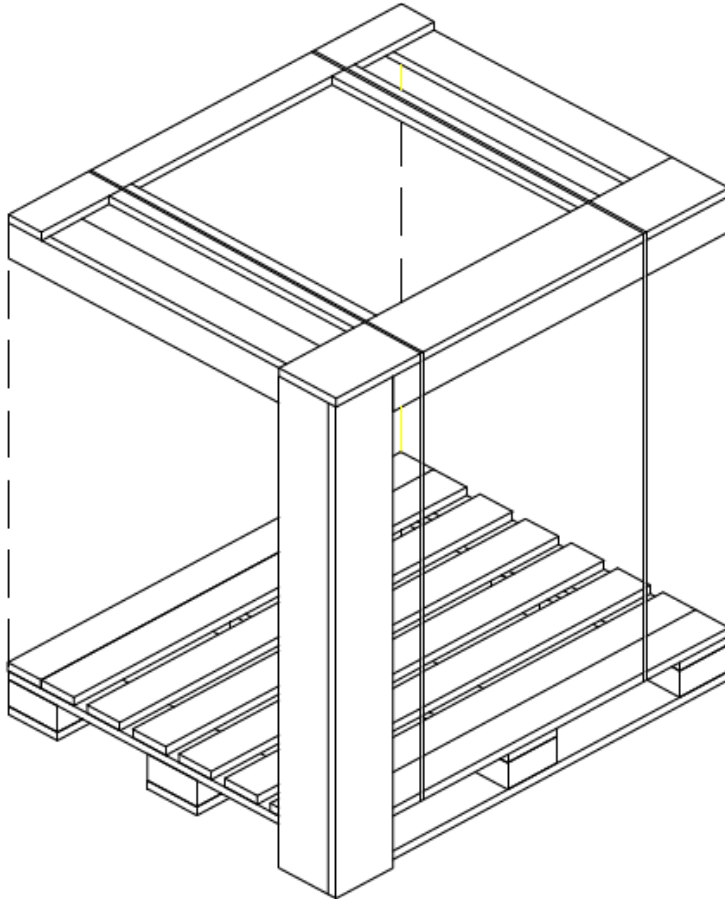
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*Fig. 3 Pallet final configuration*

- loading unit packing has to prevent water infiltration and humidity.

To satisfy the requirements above:

- proper fixing tools (such as board or plastic bars and corners) must be used to guarantee stability of loading unit;
- a plastic sheet (e.g. LDPE, 0.2 mm thick) must be put on top to the piles of boxes to contain them and protect them from water and humidity
- the multiple cartons located on the pallet must be contained in a thermo-resistant plastic bag (e.g. LDPE, 0.1 mm thick) or in a wrapped polyethylene film (e.g. LDPE film, 25 micron) to guarantee stability of loading unit and protection from humidity;
- plastic or metallic straps shall be used to fasten the boxes to the wooden pallet (tools such as board or plastic bars and corners shall be used to prevent boxes damage during straps tightening).

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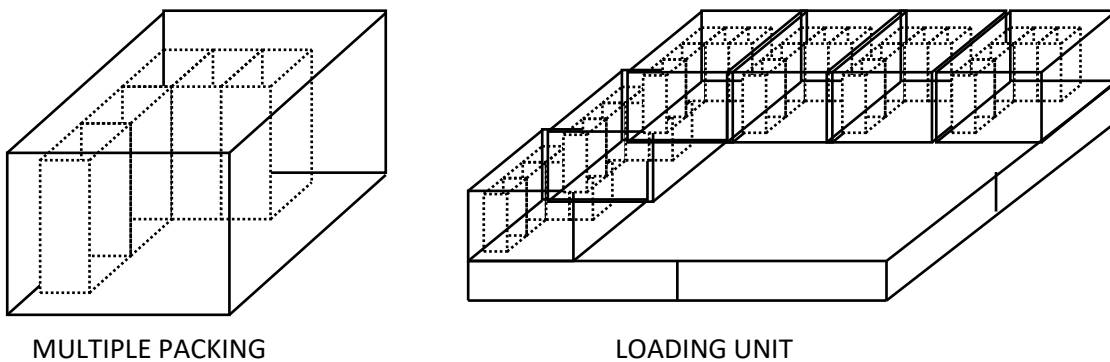
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Labels containing proper information, shall be fixed to each loading unit.

Insert the Purchase Order/item number and Invoice number on the external label of the pallet (Currently in the standard that is sent, it does not contain the information).

**8. PACKING LABELLING**

The Fig. 4 shows a scheme of packing, with single CE packing (Level 0) collected in multiple packing (Level 1) which are then collected on a loading unit (Level 2).



*Fig. 4 Packing scheme*

Adhesive labels for products tracking will be stuck on multiple packets and loading units.

Each multiple packing will be provided with an identification label including:

- barcode string;
- clear code string (reporting same data of barcode);
- a description field containing the additional information defined later

Each loading unit will be provided with an identification label including:

- barcode string;
- clear code string (reporting same data of barcode);
- a description field containing the additional information defined later

A sample of the labels above shall be sent to Enel for approval before the beginning of production.

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## 9. STANDARD CHARACTERISTICS OF THE BARCODES

The basic characteristics of the barcodes printed on labels are summarised below:

**Code type**

The type of barcode to be used for the labels is alphanumeric code EAN 128 (according to ANSI rules).

**Character's subset**

Character's subset A (according to ANSI rules) shall be used.

**Code opening and closing**

The two characters are peculiar to each data string; the type of bar code automatically defines such characters.

**Code control**

As required in code 128 standard, code control shall be made through:

- characters self-checking (on an equal amount of modules);
- check digit module 103.

**Fixed digits**

Fixed digits are defined characters used to identify the information included in the barcode string: the fixed digits are located at the beginning of each information contained in a barcode string.

The fixed digits used in barcode strings are listed below:

- OD PO number;
- M part number (PN)
- F supplier's code;
- Q quantity;
- I identification code of packing type;
- N packing progressive number;
- C total number of multiple packing (for loading units only).

**Bar dimension**

As per code 128 standard:

- each character includes 11 modules, distributed in three bars and three spaces (both having an entire module multiple thickness - from 1 to 4);

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- the module thickness must not be lower than 0.19 mm.

**Distance among symbols**

As per code 128 standard:

- minimum distance between a symbol (series of characters) and the subsequent one must be higher than the maximum between the dimension of 10 modules and 2.54 mm.

**Margins**

The distance of bar codes from the margins of the label (up, down, left and right) must be at least 4 mm.

**Density type**

Density type required for bar codes is Medium.

**Resolution type**

Resolution type required for bar codes is Medium.

**Barcode String**

In addition to the opening and closing characters peculiar to code 128 type, the string must contain the control character and the proper fixed digits related to the data sequence in the barcode (see Fixed Digits).

**Barcode string printing**

The barcode strings must be printed inside the label with up alignment in vertical direction and with left alignment in horizontal direction.

**Distance between two strings**

The distance between two barcode strings (in vertical or horizontal direction, depending on the chosen alignment) must be such to guarantee the correct reading of a barcode string preventing interference with another barcode or part of another barcode.

**Clear coding of the barcode**

The string of clear characters (symbols, letters, numbers, etc.) corresponding to each barcode must be reported under the barcode itself, not including the control digits and check digit.

All alphabetical digits of the clear coding shall be in capital letters, minimum font size: 12 normal (size in DTP points, 1 point≈0.3528 mm).

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**Identification of the barcode**

An identifying label shall be printed above each barcode string.

Printed text for first barcode string shall be as below:

N° de orden / N° material

Printed text for second barcode string shall be as below:

identificação de conteúdo

minimum font size: 8 normal (size in DTP points, 1 point≈0.3528 mm).

**10. STANDARD CHARACTERISTICS OF THE LABELS**

The wording or the required labels shall be agreed with Enel before beginning of production shipment.

Identification adhesive labels shall be stuck on:

- multiple packing: at least on one side (preferably the smaller one);
- loading unit: must be located on both the two shorter sides, in the central area of the loading unit side.

All multiple packing units must be placed on the loading unit with one label visible.

Chemical-physical characteristics of the adhesive identification label must guarantee stickiness, abrasion resistance, readability of the barcodes and of the other information present on the label for at least 36 months, with a temperature ranging between -40 and +70 °C and with 85% relative humidity.

The typical size of the labels must be:

- ISO A6 - (148 x 105 mm) for the multiple packing<sup>c</sup>;
- ISO A5 - (210 x 148 mm) or ISO A6 – (148 x 105 mm) for the loading units<sup>2</sup>.

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<sup>c</sup> A6 is the minimum acceptable size.



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## 11. CHARACTERISTICS OF THE LABEL FOR MULTIPLE PACKING

### 11.1 Bar code information

**First string**

Purchase Order Specification Number of Enel and code number of Enel material for a total length of 20 characters compose the first barcode string.

This information univocally identifies a determined order submitted to the supplier.

**Order Specification Number**

The information on Order Specification Number is represented in the following format<sup>d</sup>:

**ODxxxxxxxxxxMZmmmmmm**

The contained information is as follows:

**OD** is the fixed code which identifies the subsequent data (xxxxxxxxxx) as the PO number;

**XXXXXXXXXX** are ten alphanumerical digits indicating the number of the PO number.

**M** is the fixed code which identifies the subsequent data (mmmmmm) as the code number of Enel material (PN);

**Z** is the fixed code

**mmmmmm** are six digits indicating the Enel material PN (defined as follows:

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<sup>d</sup> All alphabetical digits must be capital letters.

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**Second string**

The CEM's code, the meters Quantity and progressive packing number for a total length of 18 characters compose the second barcode string.

This information univocally identifies a determined material, the delivered quantity, and the progressive packing number.

The information composed by the CEM's code, the quantity, the packing type and the progressive packing number, is represented by the following format<sup>e</sup>:

**FfffQqqqJjNnnnnnnn**

The string is composed by the following data:

- |            |  |
|------------|--|
| <b>F</b>   | is the fixed code which identifies the subsequent data (fff) as the CEM's code (fixed);  |
| <b>fff</b> | are three digits, the first two (CEM's code) identify the supplier and the assembly plant respectively, the third code identifies the final customer<br>The CEM's and final customer code will be supplied by Enel |
| <b>Q</b>   | is the fixed code which identifies the subsequent data (qqq) as the electronic meters quantity included in the multiple packing;   |
| <b>qqq</b> | are three digits indicating the number of electronic meters contained in the multiple packing;   |
| <b>J</b>   | is the fixed code which identifies the subsequent data (j) as the packing type;  |
| <b>j</b>   | is a letter identifying the packing type (C stands for multiple packing);  |
| <b>N</b>   | is the fixed code which identifies the subsequent data (nnnnnn) as the packing progressive number;   |

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<sup>e</sup> All alphabetical digits must be capital letters.

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**nnnnnnnn**

are seven numerical digits indicating the packing progressive number starting from 0000001 and incremented continuously from the first multiple packing throughout all the production related to a supplier code.

The number must never be reset, even if the supply is interrupted in time.

**11.2 Information shown in the description area**

The information to be reported in the description area must be printed using easily readable typeface (Arial or similar font is recommended).

All font sizes below are reported in DTP points (1 point≈0.3528 mm):

**CEM's name**

minimum font size: 20, bold.

**ENEL trade mark**

approximate size 28.4x14.5 mm (see **Errore. L'origine riferimento non è stata trovata.**).

**Material name**

minimum font size: 24, bold.

**Short indications (e.g. Trifasico - 230 V)**

if required, aligned to material name, minimum font size: 14, normal.

**Material names and short indications**

Material names and short indications for devices are reported below as they have to be printed on labels: minimum font size: 24, bold.

**Material PN**

Device part numbers must match the purchase order (parts in bold only need to be printed on the labels).

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minimum font size: 18, bold.

**Packing progressive number**

Is the packing progressive number starting from 0000001 and incremented continuously from the first multiple packing and throughout all supply related to the same supplier code:

**Caixa n° nnnnnnn**

minimum font size: 24, bold.

**Number of units in multiple packing****Quantidade nnn**

minimum font size: 14, normal.

**Lot number**

Lot number identifies the shipment batches (size of shipment batches defined by the CEM) and shall be as below:

**Lote fff-Zmmmmmm-yy-ddd-nnnnn**

length 24 digits<sup>f</sup>, minimum font size: 14 (normal), where:

fff CEM and final customer code;

Z is the fixed code to identify meter PN

mmmmmm Meter PN

yy year<sup>g</sup>;

ddd day of completion of the first packing unit of the first loading unit of the shipment lot;

nnnnn is the progressive shipment batch number, starting form 00001 and incrementing by 1 at each shipment lot (separated lots for each material, single sequence for lots counting).

For example 20A-Z510062-09-317-00850 identifies the shipment lot 850 of the device having Meter PN 510062 of the CEM 20 and produced for final customer A, with the first multiple packing of the lot having been filled on the day 317 of 2009 (i.e. November 13<sup>th</sup> 2009).

**Multiple packing weight**

Is the typical weight in kilograms of the complete multiple packing<sup>h</sup>:

**Kg. nn.nn**

---

<sup>f</sup> Included "-" separating data.

<sup>g</sup> Year and day are referred to the completion of the first box of a shipment lot (which normally matches the creation of its label).

<sup>h</sup> It is not required to update it in case of not complete packing.

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minimum font size: 14, normal.

**Multiple packing volume**

Is the total volume of the multiple packing (expressed in cube meters)

**m<sup>3</sup> n.nnn**

minimum font size: 14, normal.

**Country of final tests and packing**

**Made in xxxxxxxx**

where “xxxxxxx” is the Country where the plant performing final tests and packing of the CEM is located.

minimum font size: 14, normal.

**Conventional signs**

They are stuck or printed outside the packing showing the conventional signs according to **Errore. L'origine riferimento non è stata trovata.** standards listed below:

symbol N.1 ISO-780 cap. 2.4.1

symbol N.3 ISO-780 cap. 2.4.1

symbol N.6 ISO-780 cap. 2.4.1

symbol N.14 ISO-780 cap. 2.4.1

required signs are reported Ch. 11.

**12. CHARACTERISTICS OF THE LABEL FOR LOADING UNIT****12.1 Bar code information****First string**

Purchase Order Specification Number of Enel and code number of Enel material for a total length of 20 characters compose the first barcode string.

This information univocally identifies a determined order submitted to the supplier.

**Order Specification Number**

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The information on Order Specification Number is represented in the following format<sup>1</sup>:

**ODxxxxxxxxxxMZmmmmmm**

The contained information is as follows:

**OD** is the fixed code which identifies the subsequent data (xxxxxxxxxx) as the PO number;

**XXXXXXXXXX** are ten alphanumeric digits indicating the number of the PO number.

**M** is the fixed code which identifies the subsequent data (mmmmmm) as the code number of Enel material (PN);

**Z** is the fixed code to identify the Enel PN

**mmmmmm** are six digits indicating the Enel PN defined as follows:

**Second string**

The CEM's code, the meters Quantity and progressive packing number for a total length of 20 characters compose the second barcode string.

This information univocally identifies a determined material, the delivered quantity, and the progressive packing number.

The information composed by the CEM's code, the quantity, the packing type and the progressive packing number, is represented by the following format<sup>7</sup>:

**FfffQqqqJjNnnnnnnCcc**

The string is composed by the following data:

**F** is the fixed code which identifies the subsequent data (oo) as the CEM's code (fixed);

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<sup>i</sup> All alphabetical digits must be capital letters.

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**fff** are three digits, the first two (CEM's code) respectively identify the supplier and the assembly plant, the third code identifies the final customer  
The CEM's and final customer code will be supplied by Enel

**Q** is the fixed code which identifies the subsequent data (qqq) as the electronic meters quantity included in the loading unit;

**qqq** are three digits indicating the number of electronic meters contained in the loading unit;

**J** is the fixed code which identifies the subsequent data (t) as the packing type;

**j** is a letter identifying the packing type (P stands for loading unit);

**N** is the fixed code which identifies the subsequent data (nnnnn) as the packing progressive number;

**nnnnnn** are six numerical digits indicating the loading unit progressive number starting from 000001 and incremented continuously from the first loading unit throughout all the production related to a supplier code.  
The number must never be reset, even if the supply is interrupted in time.

**C** is the fixed code which identifies the subsequent data (cc) as the number of loading unit;

**CC** are two numerical digits indicating the number of multiple packing units on loading unit.

## 12.2 Information shown in the description area

The information to be reported in the description area must be printed using easily readable typeface (Arial or similar font is recommended).

All font sizes below are reported in DTP points (1 point≈0.3528 mm):

**CEM's name**

minimum font size: 20, bold.

**Enel trade mark**

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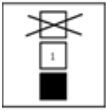
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approximate size 28.4x14.5 mm (see Fig. 3).

**Maximum number of stackable loading units symbol**

approximate size 22.2x22.2 mm (see Fig. 3).



*Fig. 3 Stacking limit symbol*

**Material name**

minimum font size: 24, bold.

**Short indications (e.g. Trifasico – 120/ 240 V)**

if required, aligned to material name, minimum font size: 14, normal.

**Material names and short indications**

Material names and short indications are reported below as they have to be printed on labels:

- Name of meter product

minimum font size: 24, bold.

**Material PN**

Part numbers for devices are listed below (bold parts only have to be printed on labels):

minimum font size: 18, bold.

**Packing progressive number**

Is the packing progressive number starting from 0000001 and incremented continuously from the first loading unit and throughout all supply related to the same supplier code:

**Palet n° nnnnnn**

minimum font size: 24, bold.



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**Number of multiple packing units in loading unit****Caixa nn**

minimum font size: 14, normal.

**Number of units in multiple packing****Quantidade nnn**

minimum font size: 14, normal.

**Lot number**

Lot number identifies the shipment batches (size of shipment batches defined by the CEM) and shall be as below:

**Lote fff-Zmmmmmm-yy-ddd-nnnnn**length 24 digits<sup>j</sup>, minimum font size: 14 (normal), where:

- fff CEM and final customer code;
- Z is the fixed code to identify Enel PN
- mmmmm Enel PN;
- yy year<sup>k</sup>;
- ddd day of completion of the first packing unit of the first loading unit of the shipment lot;
- nnnnn is the progressive shipment batch number, starting from 00001 and incrementing by 1 at each shipment lot (separated lots for each material, single sequence for lots counting).

For example 20A-Z510062-09-317-00850 identifies the shipment lot 850 of the device having Enel PN 510062 of the CEM 20 and produced for final customer A, with the first multiple packing of the lot having been filled on the day 317 of 2009 (i.e. November 13<sup>th</sup> 2009).

**Loading unit weight**

Is the typical weight in kilograms of the complete loading unit<sup>l</sup>:

**Kg. nn.nn**

minimum font size: 14, normal.

**Loading unit volume**

Is the total volume of the loading unit (expressed in cube meters)

---

<sup>j</sup> Included "-" separating data.

<sup>k</sup> Year and day are referred to the completion of the first box of a shipment lot (which normally matches the creation of its label)

<sup>l</sup> It is not required to update it in case of not complete packing.

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**m<sup>3</sup> n.nnn**

minimum font size: 14, normal.

**Country of assembly****Made in xxxxxxxx**

where “xxxxxxx” is the country where the assembly plant of the CEM is located.

minimum font size: 14, normal.

**Conventional signs**

They are stuck or printed outside the packing showing the conventional signs listed below:

- symbol N.1      ISO-780 cap. 2.4.1
- symbol N.3      ISO-780 cap. 2.4.1
- symbol N.6      ISO-780 cap. 2.4.1
- symbol N.14     ISO-780 cap. 2.4.1

required signs are reported in Ch. 10.

**13. ISO PACKING SYMBOLS**

Size of symbols group 100x100 mm

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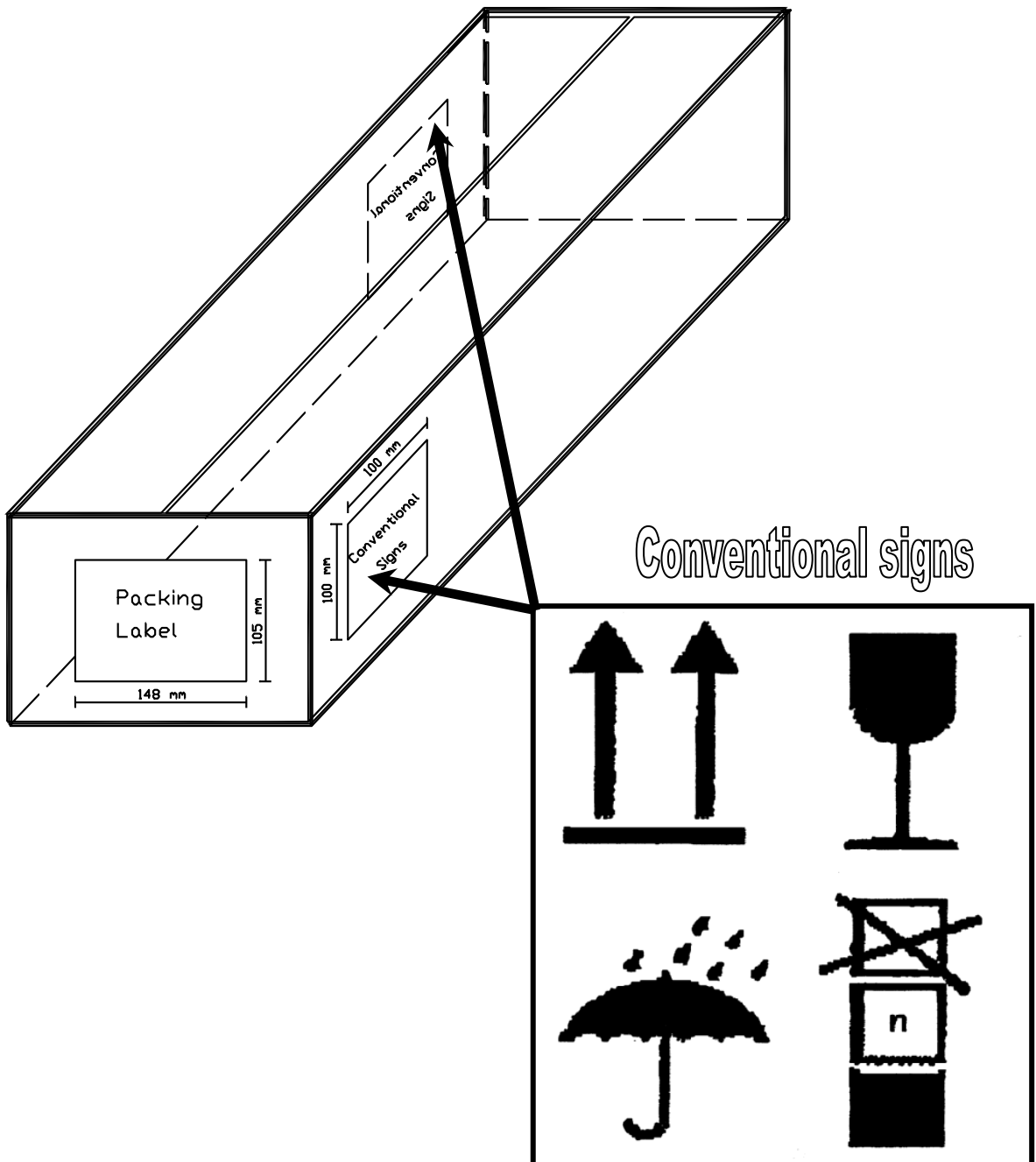
**Application Areas**

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## 14. PACKING LABELS

### 14.1 Brazilian Material Labels

The packed parts should be easily identified and kept separate from all other similar procured parts with the object to separate Enel Brazilian shipment from every other customers.

The Packaging Unit Labels shall reflect the following specifications:

#### 12.1.1 Brazilian Material Codes and Reference

The following Brazilian material codes, included into the box, related material code to the purchase order.

#### 12.1.2 Supplier's Name

The packing labels should identify the supplier's name on the box as follows:

Supplier's name: ENEL

The character shall be at least 13mm height and bold.

#### 12.1.3 Device ESN

Add on the box label the barcode of the ESN device, the height of the barcode must be at least 1cm (see Fig.4 only like example)



Fig.4: example of box label

## 15. TRACKING OF PACKING AND DEVICES (LOGISTIC FILE)

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The manufacturing process of the Contract Manufacturer must be managed by a FIS (Factory information system). The FIS (of the Contract Manufacturer) must manage all the information related to the entire production process, from materials acceptance to the delivery of finished products, including:

- A. the association of each multiple packing with the serial number of each device contained in the packing itself;
- B. the association of each loading unit with the identification codes of each multiple packing contained in the loading unit itself.

For each CE shipment lot the manufacturer has to provide 1 text files (called "logistic files") including the following information<sup>m</sup> for each CE included in the shipment lot:

FIELD	TYPE	LENGTH	OFFSET
1 first string Loading Unit (ch. 12.1)	Text	20	alignment to left
2 second string Loading Unit (ch. 12.1)	Text	20	alignment to left
3 first string Multiple Packing (ch. 11.1)	Text	20	alignment to left
4 second string Multiple Packing (ch. 11.1)	Text	18	alignment to left
5 CE-ID	Text	18	alignment to left
6 Lot Number	Text	24	alignment to left
7 Shipment Date <sup>n</sup>	Text	10	alignment to left
8 Material part number	Text	6	alignment to left
9 ADCE	Text	12	alignment to left
10 keys filename	Text	33	alignment to left
11 keys CD name	Text	11	alignment to left
12 hw version	Text	6	alignment to left
13 sw version	Text	2	alignment to left
14 sw version fixed	Text	2	alignment to left

For each LVC shipment lot the manufacturer has to provide a single text file (LVC logistic file) including the following information for each LVC, if the modem is embedded in the LVC:

<sup>m</sup> Each shipment lot (and the related logistic file) must include meters/LVCs supplied by a single supplier, of a single model, for a single customer.

<sup>n</sup> Expected shipment day at the moment of production of the shipment lot, required format is: dd-mm-yyyy

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FIELD	TYPE	LENGHT	OFFSET
1 first string Loading Unit (ch. 12.1)	Text	20	alignment to left
2 second string Loading Unit (ch. 12.1)	Text	20	alignment to left
3 first string Multiple Packing (ch. 11.1)	Text	20	alignment to left
4 second string Multiple Packing (ch. 11.1)	Text	18	alignment to left
5 LVC-ID	Text	16	alignment to left
6 Lot Number	Text	24 <sup>o</sup>	alignment to left
7 Shipment Date <sup>p</sup>	Text	10	alignment to left
8 Material part number	Text	6	alignment to left
9 ADLVC	Text	12	alignment to left
10 LVC communication data filename	Text	23	alignment to left
11 hw version	Text	4	alignment to left
12 sw version	Text	6	alignment to left

If the LVC includes an external and replaceable modem then the supplier shall provide the file above and an additional text file (modem identification file) including the following information for each LVC-modem set:

FIELD	TYPE	LENGHT	OFFSET
1 LVC-ID	Text	16	alignment to left
2 MDM-ID	Text	7	alignment to left
3 IMEI	Text	15	alignment to left

hw and sw versions reported in logistic files will be defined by Enel before production start-up.

Each logistic file must be delivered in two formats.

The format of the logistic file is plain text (ASCII format ANSI subset) with data fields of each CE/LVC separated by TAB.

The CEM shall deliver to Enel both the original logistic file and a second file which is the text file above signed using the standard signature function provided by "Entrust®" software application.

The filenames of the logistic files of the CEs

<sup>o</sup> Including "-" between data.

<sup>p</sup> Expected shipment day at the moment of production of the shipment lot, required format is: dd-mm-yyyy

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## ABffnnnn.dat

- A code identifies the CE and LVC supplier:
- B identifies the CE and LVCs model code
- ff code identifies the CEM which produced the CEs and LVCs and the final customer identification code
- nnnn includes the last 4 digits of the progressive shipment batch number

In addition, for each delivery, the manufacturer has to provide a pdf file (called "declaration of conformity file") reporting the ESN of all the meters packed in the pallet and the date of completion of the pallet (packing date).

The files above shall be sent using the same secure data communication channel used for keys data transfer, if available, else e-mail delivery will be allowed.

Derogations to the rules above for management and delivery of data will have to be agreed between Enel and the CEM.

## 16. SMART METER KEYS MANAGEMENT OVERVIEW

Each smart meter has two unique keys (K1 and K2 – 16 bytes length), different from each meter device from the others, to avoid access to internal meter data from unauthorized users. The keys are generated randomly at manufacturing time, in an offline and protected (against intentional and unintentional access) key writing station, and written in the meter at the same time.

After key writing procedure, for each meter is mandatory to save the keys on file system in encrypted format and afterwards send the encrypted and signed binary data to the ENEL central system.

### Encryption mode

The encryption mode used in current architecture is the asymmetric type provided by public key infrastructure managed by Entrust™.

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The central system has an Entrust™ Profile File (EPF file) as key file store that contains the public and private keys. The public key is delivered to the suppliers as .der file (or equivalent format) so, with this key, the supplier can encrypt the meter keys.

To distribute the encrypted key is mandatory create a pkcs#7 object (only encrypted) using the algorithm **AES\_256\_CBC** and the public key (.der) supplied by central system; at the end, the keys received by the central system will be decrypted using the private key stored in EPF file and loaded in central database.

File structure

The binary file contains *n* records with encrypted keys of each meter and has this structure:

*<record 1> ... <record i> ... <record n>*

Where *<record i>* has:

- A prologue with 4 fixed bytes: **####**
- Serial Number of meter (18 bytes)
- Ip address (nid) (6 bytes)
- A separator with 4 fixed bytes: **\$\$\$\$**
- 4 bytes which represent the Length of k1 encrypted in format MSB first
- K1 encrypted data
- A separator with 4 fixed bytes: **&&&&**
- 4 bytes which represent the Length of k2 encrypted in format MSB first
- K2 encrypted data

Sign file

At the end of process, when all meter keys are written in file system, the supplier must sign the file using pkcs#7 format (CADES sign for binary files), using a valid certificate, so the file can be delivered to central system as **.p7m**