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EMC BULLETIN

10 July 2025

European Directive for Electromagnetic Compatibility

The term electromagnetic compatibility (EMC, from the English Electromagnetic Compatibility) refers to the topic, in the field of electrical and electronic engineering, which studies the unintentional generation, transmission and reception of electromagnetic energy in relation to the undesirable effects they might entail, with the aim of ensuring the correct functioning in the same environment of the different devices that involve electromagnetic phenomena during their operation. The European Directive 2014/30 is intended as an aid for the removal of trade barriers between member states, thus overcoming the problems due to technical standards which differ from one country to the other.

The specifications of the Directive are legal: each European manufacturer of electrical and electronic systems is solely responsible for the conformity of its products and the appropriate affixing of the CE marking on the same products.

The interferences concern two distinct paths: in the first case they are radiated in the space around each cable, printed circuit or single component that behaves like an antenna while, in the second case, they are conducted through the interconnections between systems, boards and even long cables of supply. Due to its specific nature it is imperative, but not sufficient, that the electromagnetic compatibility is taken into due account in the design phase of each individual product: the designer attentive to EMC aspects has several options to choose from.

Electromagnetic Emissions of Generating Sets

An electromagnetic disturbance may consist of electromagnetic noise, an unwanted signal or an alteration of the propagation device itself.

It is clear that the generator stands within the scope of application of the Directive as it incorporates components that can emit electromagnetic disturbances. It is therefore an electromagnetically active machine, characterized by the possible emission of electromagnetic disturbances, but not only.

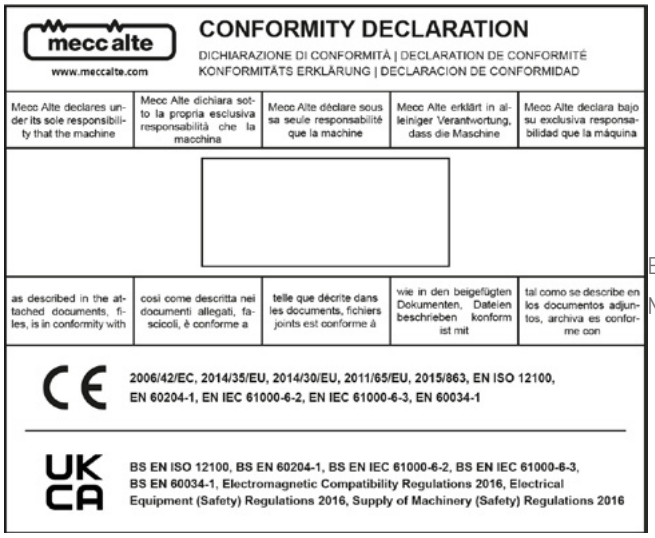
The problems can be summarized in:

- **Emission into the environment;**
- **Immunity from the environment;**
- **Self-disturbance;**
- **Disturbances on the networks.**

The issue mainly concerns the susceptibility of radio and telecommunications equipment to electromagnetic disturbances from the generating set, which on the other hand is immune to emissions from radio and telecommunications equipment. In terms of electromagnetic emissions, the possible sources of disturbance can be identified in the following components of the generator:

- **The alternator;**
- **Electronic devices on the machine;**
- **The commands and control panel.**

It is clear that these components must comply with the 2014/30 Directive; they must therefore have a declaration of conformity that refers to the EMC directive and a CE marking.



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CONFORMITY DECLARATION

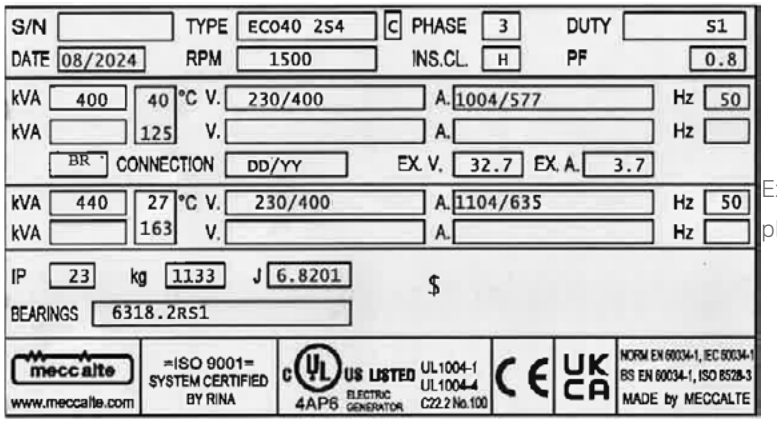
DICHIARAZIONE DI CONFORMITÀ | DECLARATION DE CONFORMITÉ
KONFORMITÄTS ERKLÄRUNG | DECLARACION DE CONFORMIDAD

Mecc Alte declares under its sole responsibility that the machine	Mecc Alte dichiara sotto la propria esclusiva responsabilità che la macchina	Mecc Alte déclare sous sa seule responsabilité que la machine	Mecc Alte erklärt in alleiniger Verantwortung, dass die Maschine	Mecc Alte declara bajo su exclusiva responsabilidad que la máquina
as described in the attached documents, files, is in conformity with	così come descritta nei documenti allegati, fascicoli, è conforme a	telle que décrite dans les documents, fichiers joints est conforme à	wie in den beigefügten Dokumenten, Dateien beschrieben konform ist mit	tal como se describe en los documentos adjuntos, archiva es conforme con

CE 2006/42/EC, 2014/35/EU, 2014/30/EU, 2011/65/EU, 2015/863, EN ISO 12100, EN 60204-1, EN IEC 61000-6-2, EN IEC 61000-6-3, EN 60034-1

UKCA BS EN ISO 12100, BS EN 60204-1, BS EN IEC 61000-6-2, BS EN IEC 61000-6-3, BS EN 60034-1, Electromagnetic Compatibility Regulations 2016, Electrical Equipment (Safety) Regulations 2016, Supply of Machinery (Safety) Regulations 2016

Extract from the EC Declaration of Conformity Mecc Alte



S/N | TYPE EC040 2S4 | C | PHASE 3 | DUTY S1
DATE 08/2024 | RPM 1500 | INS.CL. H | PF 0.8

kVA 400	40 °C	V. 230/400	A. 1004/577	Hz 50
kVA	125	V.	A.	Hz

BR | CONNECTION DD/YY | EX. V. 32.7 | EX. A. 3.7

kVA 440	27 °C	V. 230/400	A. 1104/635	Hz 50
kVA	163	V.	A.	Hz

IP 23 | kg 1133 | J 6.8201 | $
BEARINGS 6318.2RS1

mecc alte www.meccalte.com | =ISO 9001= SYSTEM CERTIFIED BY RINA | c UL us LISTED 4AP6 ELECTRIC GENERATOR UL1004-1 UL1004-4 C22.2 No.100 | CE | UKCA | NORM EN 60034-1, IEC 60034-1 BS EN 60034-1, ISO 8528-3 MADE by MECCALTE

Example of Mecc Alte identification plate showing the CE marking

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ALTERNATOR

As far as alternators are concerned, since they are intended to be incorporated in generating sets, they usually contain detailed instructions for their assembly, and these must be fully respected. Their declaration of conformity must explicitly refer to compliance with the LV (low voltage) directive, the machinery directive and the EMC directive, with the relevant normative references. On the basis of this certification it can therefore be assumed that the design and manufacture of the device complies with the essential requirements of the Electromagnetic Compatibility Directive:

- The electromagnetic disturbances produced must not reach an intensity such as to prevent the normal operation of radio and telecommunications equipment;
- The equipment exhibits a level of immunity to electromagnetic disturbances foreseeable under the conditions of use for which it is intended, such as to prevent normal operation from unacceptable deterioration.

COMPLYING WITH THE DIRECTIVE

As a manufacturer, we have two possibilities to demonstrate the conformity of our products. We can either entrust a certification body and use the technical report they would issue to prove compliance or, as an alternative, we can prepare preparing a technical file or, as the English call it, a Technical Construction File (TCF).

The technical file is to be filled in by Mecc Alte and we have to describe in detail the measures taken to comply with the directives. It is a confidential document that cannot be shared, as it is part of the corporate know-how.

At this point the product would still require some tests to check the level of immunity and or radiation; it is however the faculty of Mecc Alte (the manufacturer) to decide which and how many models are to be tested. The competent authorities may ask to check the conformity of a product in the case of a complaint made by a user or even a competitor.

Should this happen, we can defend ourselves by demonstrating that we have done everything necessary to comply with the directive. It would be easier for our defense to have evidence to support our statements, such as test reports conducted by laboratories of recognized institutions.

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LEGISLATIVE PANORAMA

The first consideration to make refers to the current regulatory situation: there are specific directives and standards referring to a product, or a series of products, that enable manufacturers to be oriented precisely in the context of the conformity assessment tests, while for many other products, such as electric generators, there are no specific rules but only generic ones.

The latter are more restrictive than the specific ones and must therefore be applied to those products that fall under the category with no specific product standards requirement, and therefore doubtful.

Compatibility tests are divided into emission tests and susceptibility tests.

The emission measurements are significant and repeatable; the value of the test result allows the phenomenon to be assessed and repeated wherever it is measured.

The current legislation describes the method, the tools, the kind of tests and the location where tests should be performed; a free field or anechoic chamber.

Susceptibility measures are not significant measures and are not repeatable; these tests do not obtain definite values but the behaviors of the generator can be observed. Thanks to these behaviors it will be possible to define the class of the machine under test.

The harmonized standards that allow the presumption of conformity to the EMC directive are the following:

- **EN 61000-6-1 immunity for residential, commercial and light industrial environments.**
- **EN 61000-6-2 immunity for heavy industrial environments.**
- **EN 61000-6-3 emissions for residential, commercial and light industrial environments.**
- **EN 61000-6-4 emissions for heavy industrial environments**

With regards to the environments of reference, the emission limits of the “light” industrial environment (EN 61000-6-3) are more restrictive than the corresponding limits of the “heavy” industrial environment (EN 61000-6-4). Therefore, compliance with the former also implies compliance with the second standard mentioned.

The situation is the opposite for the immunity requirements: compliance with the levels associated with the “heavy” industrial environment (EN 61000-6-2) implies compliance with the (lower) levels indicated for the “light” industrial environment (EN 61000 -6-1).

Therefore, compliance with EN 61000-6-2 and EN 61000-6-3 standards allows the product to be used in both environments.

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CONFORMITY OF MECC ALTE GENERATORS

Model	Conformity to norms VDE 0875 (grades G,N, K)	Conformity to norms EN61000-6-3; 61000-6-2	Conformity to norms MIL 461-462
ECP3/BTP3	X	X	on request
ECP4	X	X	on request
LT3	X	X	on request
NPE	X	X	on request
ECP28	X	X	on request
ECP30	X	X	on request
ECP32	X	X	on request
ECP34	X	X	on request
EC038	X	X	on request
EC040	X	X	on request
EC043	X	X	on request
EC046	X	X	on request
HCP3	X	X	on request
HCP32	X	X	on request
HCP34	X	X	on request
HC038	X	X	on request

Our standard range therefore meets the VDE 0875 standard (reference standard before the EC Directives) and the essential safety requirements imposed by the European directive on electromagnetic compatibility.

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MIL RULES

The military standards foresee limits of conducted and radiated radiation which are different than those in civil regulations, as are the different measurement methods, and the degree of susceptibility of the machine with respect to external impulses. Mecc Alte products have been used in multiple applications governed by military-type regulations and have successfully qualified. Since installations change case after case, normally the military client requires detailed tests performed in an anechoic chamber. These may include:

1. **The test of the single sub-components in accordance with the MIL requirements and the test of the final assembled component (the generator)**

2. **The final assembled test only.**

From the experience of Mecc Alte, customers can select suitable EMI filters from the optional accessories catalog, with these filters the electric machine will be compatible with the emissions required by these regulations. However, in cases of adherence to the MIL requirements the actual cost of the laboratory certification shall be billed to the customer.

The choice to validate either the list of all individual components, or to validate the finished generator only is normally taken by the customer.

If the above-mentioned tests are required, we invite customers to discuss the options with the Mecc Alte representative at the moment of placing orders, so as to select the appropriate filters and the relative tests.

This confirmation cannot be made solely by Mecc Alte (the manufacturer) on the basis of previous data, or on project data on the card. As mentioned, tests much be performed in an anechoic chamber upon request by customers.

Mecc Alte is pleased to be able to offer these EMC certification services, as a founding member of an EMI-EMC emission research and verification consortium.

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PACEMAKER

Considerations for Pacemaker Users in Environments with Mecc Alte Generators

Generators designed and manufactured by Mecc Alte comply with international standards concerning electromagnetic emissions and, under standard operating conditions, should not interfere with cardiac pacemakers or other implantable medical devices.

That said, environments that incorporate electrical equipment and power systems—especially those involving high currents or strong magnetic fields—may present localized electromagnetic exposure that could be of concern for individuals with such implants. It's crucial to recognize that electromagnetic compatibility (EMC) is not only about compliance with radiation limits but also about ensuring that nearby medical technologies are not adversely affected by the presence of electrical fields.

To address this, site-specific assessments are strongly advised wherever personnel or visitors with implanted medical devices may be present. These assessments should verify that ambient electromagnetic field levels are within thresholds considered safe for such devices.

For accurate evaluation and mitigation, it is advisable to:

- Consult local occupational health and safety authorities for guidance tailored to national regulations;
- Engage with the manufacturers of the medical implants to understand the specific sensitivity and shielding requirements of the devices involved;
- Ensure that site design and generator installation follow best practices in electromagnetic compatibility.

Implementing these precautions will help ensure a safe working environment and avoid potential interference with life-sustaining medical technology.