



NEO-WiFi EMC = Secure operation

Have you ever had a sporadic and inexplicable malfunction of electrical/ electronic devices? For example, an automatic gate, a computer, a PLC, a circuit breaker ... If you didn't find the fault, it was probably due to the electromagnetic compatibility of the device (not sufficiently immune to electrical/electromagnetic interference received from the power line or radiated in the air) or to that of other equipment that showed no malfunction but was disturbing your device. Electromagnetic compatibility is a requirement prescribed by law and by the need to guarantee the operation of all electrical/electronic equipment, on the basis of which it must in practice:

- limit below precise thresholds emissions of electrical and electromagnetic interference which can affect the operation of other devices, whether the interference is radiated through the air or conducted in the power line or in the earth return circuits;
- be immune to a series of conducted and radiated interference that may be present in the environment in which it is intended to operate.



It is important therefore not only to protect the operation of the inverter (variable speed drive), but also to protect all the other devices from it. Electromagnetic compatibility is therefore the result of coexistence without reciprocal interference of devices in the same environment.

In an industrial environment, the immunity level must be higher compared to the others, but on the other hand, in a residential, commercial or light industrial environment, it is necessary to limit potential interference emissions more than in the industrial environment. So the regulations define these two environments:

DOMESTIC, COMMERCIAL AND LIGHT INDUSTRIAL ENVIRONMENT

(ref. EN 50081-1, para 5)

This concerns residential, commercial and light industrial locations, both internal and external.

Locations with a power supply from 50 to 1000V provided direct from the public network are considered residential, commercial or light industrial locations.



INDUSTRIAL ENVIRONMENT

(ref. EN 50081-2, para 5)

Industrial environments are characterized by the existence of one or more of the following conditions:

- presence of industrial, scientific or medical equipment
- inductive and capacitive loads are frequently switched
- currents and associated magnetic fields are high



The part of the first definition that we have underlined contradicts a recurrent belief: in fact, not every location that is often considered an "industrial environment" is only that for the EMC regulations. Indeed, the vast majority of companies also fall within the definition of light industry and their facilities and equipment must therefore satisfy the legal requirements of both environments.



Nevertheless, most of the three-phase inverters circulating on the market are declared in conformity with the regulations which relate only to the industrial environment and, at times, they place limitations even on this.

Having said this, and wanting to talk about the EMC advantages of NEO-WiFi, we cite the two main ones:

1. maximum distance between inverter and motor

In a normal motor/inverter installation it is necessary to minimize the parasitic capacitance of the system and for this (but not with NEO-WiFi), the cables connecting motor and inverter should be short and of shielded type, or unshielded but inserted in a duct or metal tube connected to earth. This also because the cables connecting motor and inverter also radiate radio waves. It is not uncommon for inverter manufacturers, in their declaration of conformity, to specify for the sake of correctness the maximum length of the cable connecting motor and inverter and this statement may be considered valid.

With an inverter motor this problem does not exist, because motor and inverter are a single unit. If, however, we were unable to control the inverter motor in its position (under a conveyor belt, in the narrow space in which a hydraulic control unit was installed, on an industrial fan attached to a ceiling, etc.), with a normal inverter motor we would still have to have a control device connected via cable to the inverter. This problem does not exist with NEO-WiFi, whose detachable keyboard is connected to the inverter via authorized and tested radio frequencies.

2. the installation of additional anti-interference filters



To make a compatible inverter, the manufacturer will have to allow for additional costs, such as the insertion of components, shielding and filters. To offer a price apparently more attractive, a frequent trick is to not incorporate in the inverter everything you need and to resolve the problem by requiring you in the instruction manual to buy anti-interference filters separately and install them. A careless buyer may then fool themselves that they have saved, only to find out later, on reading the manual, that if he/she wants to comply with applicable laws and avoid problems operating the inverter or other devices in the same environment, he/she will have to incur additional costs for materials and installation.

Another recurrent story is installing inverters suitable only for industrial environments, even if the company has power supplied directly from the mains, putting at risk the operation of other devices. This leaves the problem to the end user to understand why an automatic gate, a computer, a PLC, a protective circuit breaker or other electronic devices in the same environment will begin to have problems of malfunction which will not be confirmed and resolved by the suppliers of the inverter.

NEO-WiFi was designed as a plug-and-play inverter motor, to avoid the costs of additional materials and labour to the buyer. It had to take into account, viewing the situation seriously, the fact of having been designed for its intended environment, without the need for additional material and installation costs.

Very unusually, therefore, in the NEO-WiFi-3 project, Motive has been careful to make it compatible not only with the industrial environment, with high immunity, but also to keep its emissions below the most restrictive thresholds prescribed for the home, commercial and light industrial environment, without the need to install additional external filters.

NEO-WiFi-7.5kW, however, because of its greater power, is the standard suitable for installation in industrial environments but requires the installation of an optional external anti-interference filter to make it suitable for the domestic, commercial and light industrial environment too.

