

CE conformity of AXV platforms, Ultract, Minact, Wave motors



*Declaration of conformity – Manufacturer's
declaration Installation instructions*

EC1.8.1.96

1.1 Wiring recommendations and CE-typical system for conformity to EMCD and LVD

1.2 EC Declaration of Conformity for the purposes of EMCD e LVD

1.3 Introduction: EC directives

The EC Directives are manufacturing prescriptions intended to guarantee a standard level of quality, reliability and safety for all industrial goods produced and marketed across the European Union. The EC Directives are general documents that establish base specifications for the certifications, which are subsequently converted into national laws by all member states. A certification issued by a member state is valid automatically in all other member states. Technical details are not included in the directives. They are determined by the relevant European harmonized standards (EN).

After verification, affixing a CE mark certifies the conformity to the CE directives. Within the EU there are no commercial barriers for a product with the CE mark. A conformity certificate, however, is generally not required for most directives. Consequently, it is not always evident which of the (so far) 21 EC directives is considered in the CE mark of a product and which standards are considered in the conformity verification.

In the field of Brushless motor drives, the CE mark is referred exclusively to the Low Voltage Directive. As for the EMCD directive, a drive is only a component and not a system, and the conformity of the system to the EMCD remains the sole responsibility of the system designer or user. In order to assist their Customers, Phase Motion Control have already proved and certified the conformity of a CE-typical system to the EMC directive (see following chapter) with the AXV digital platforms and the ULTRACT II brushless motors.

1.4 LVD Directive

The LVD directive deals with all electrical machines operating in usual environments between 50 and 1000 V AC, and between 75 and 1500 V DC. This directive does not apply to applications in particular atmospheres and/or anti-explosion machines; also it does not refer to lifting equipment.

The directive's general purpose is to guarantee a uniform electrical safety level from the point of view of user's risk and of possible damage to objects; the directive dictates the product to be supported from the point of view of safety and of application prescriptions.

1.5 Product safety

1. Transport, installation and use of the drives is reserved to qualified staff (IEC 364)
2. The opening of the drive's enclosure or motors protections, or a defective installation, can lead to personal or material damage
3. Drives and motors can have hot, rotating and live internal parts; this can be the case even with power supply turned off.

1.6 Application as directed – Scope of application

1. AXV, AX4 drives are intended for variable speed motion control application, inside the entire machine control cabinets.
2. When integrating the drives into machines, they may only be commissioned (i.e. operation as directed) if the correspondence to the EC EMC directive 89/336/EEG is proved, EN 60204 must be observed
3. The technical data on the units nameplates must be observed
4. The drives correspond to the LVD 73/23/EEG

1.7 Installation

1. The units must be installed and cooled according to the regulations stated in the corresponding documentation
2. Ensure that no components are bent or insulation distances changed during transport. The electronic components and contacts must not be touched.
3. When working on an energized controller the valid national requirements for the prevention of accidents must be observed.
4. The electrical installation must comply with applicable regulations (cable cross sections, fuses, protective conductor connections)
5. All control inputs and outputs of the drives are insulated with a “basic” insulation (functional). Another level of protection must be implemented for personal safety against electrical contact..
6. When using current-operated protective devices, please note that:
The controller have internal DC rectification. A DC fault current is therefore possible. Some differential current protection systems are made inoperative by DC current leakage. Use only “universal” or pulse operated protection devices.
The RFI filter which is built into the drives cause a certain amount of leakage current to flow in the ground wires. This current may cause tripping of too sensitive differential device and need to be taken into account while sizing differential devices.
7. Irrespective of the CE mark on both drives and motors, it is reminded that the compliance of the required limit values with the legal EMC regulations remain the responsibility of the manufacturer of the system or machine.

1.8 EC Declaration of Conformity

Ref. to EC Low Voltage Directive 72/23/EWG

ULTRACT and **MINACT** series motors and **AXV** series brushless amplifier are designed, manufactured and tested in conformity with the EC Low Voltage Directive 72/23/EWG and under the responsibility of

Phase Motion Control s.r.l., Lungobisagno Istria 27r, 16141 Genova

The applied standards are the following:

IEC 34-1, 34-5,34-6, 34-11, 34-14 e IEC 72;
EN 60529
IEC 249/1 10/86,
IEC 249/2 15/12/89
IEC 326/1 10/90,
EN 60097/9.93

1.9 The EMCD Directive (89/336EWG)

The EMCD directive relating to electromagnetic compatibility is effective for “equipment” which may either cause electromagnetic disturbances or be affected by such disturbances.

The aim is the limitation of the generation of electromagnetic disturbances so that the operation of radio and telecommunication systems and other equipment is possible and that a suitable immunity of the equipment against electromagnetic disturbances is ensured so that the operation can be achieved.

Controllers cannot be driven in stand-alone operation and therefore the controllers themselves cannot correspond to the EMC directive. The controllers must be integrated into a drive system to check the compliance with the EC directive relating to EMC of the “Regulation about the electromagnetic compatibility of devices”.

Phase Motion Control has verified the conformity of controllers integrated into a “typical” drive system (see below). The user can use this example as a reference to design a system in according to EMCD.

1.10 Installation as specified

1. The RFI filter needs a ground connection. The typical application is not operable without ground connection.
2. The drives are not domestic appliances and are not intended for domestic use.
3. For installations different from the typical application (e.g.: use of unscreened cables, use of multiple drives, etc.) the conformity to the CE-EMC directive requires a check of the machine or system regarding EMC limit values.
4. The user of the machine is responsible for the compliance with the EMC directive.
5. Screen all power cables from filters to drive and from drive to motor with a shield coverage greater than 85%

6. Signal cables must always be shielded as above.
7. In order to reduce the interference caused by the motor cable and the induced noise in the encoder connection cable, such wiring must be shorter than 15 meters. This limitation is necessary also for the protection of the drive itself. For longer cables, use appropriate snubber inductors.
8. For shield and ground connections, refer to fig. 1.
9. It is important that the power wires are inserted in wire ways different from the signal and supply one and that any cross between the power and signal cables is carried out at right angle.
10. A ground cable between the motor and the drive is always necessary with a layout similar to that of the power cables.
11. If sensitive instruments are used (for example analogue, non preamplified transducers, load cells, thermocouples etc.) keep a safe distance between the instrumentation ground and the power ground.
12. The RFI filter which is built into the drives, as well as the high chopper frequency, cause a certain amount of leakage current to flow in the ground wires. This current may cause tripping of sensitive differential protection devices. For the same reason, high frequency noise is normally conducted through the ground wire; all sensitive devices or cables should be wired at a distance from the ground wire and cross the same wire at a right angle.
13. All devices (drives, filters, motors) must be grounded on a single ground bar, with ground wires as straight and short as possible.

NOTE: As specified in the EMC IEC-22G-21/CDV norm, AXV drives are not domestic appliances and can cause interference to radio and tv reception.

1.11 EC Declaration of conformity

Ref. to EC Directive Electromagnetic Compatibility (89/336/EWG)

NOTE: ULTRACT and MINACT series motors and AXV brushless drives series are not stand-alone systems, and are specified to application fields 2 and 3 in accordance with IEC-22G-21/CDV. The conformity with EMC directive cannot be verified on such components.

To assist its own customers, Phase Motion Control declares that AXV drives running Ultract or Minact motors assembled in accordance with the instructions above and completed with the filter SHAFFNER FN251/16/07 or something equivalent, with up to 100 meters of shielded-conductor cable between the drive and the motor, following the cabling normative explained in the user manual, allows the active system (PDS) to satisfy the requirements of the IEC-EN 55011 norm Class A and EN 50022 Class B.

As Components the AXV drives comply with the IEC 1000-4-2 (IEC 801-2) and IEC 1000-4-4 (IEC 801-4), without any accessory or protection.