

EMC

EMC is an issue relating to more than just the cables in an electrical installation. Whilst cable selection does have an influence, so does how the cable is installed, its proximity to other cables and the type of electrical apparatus being used in the system.

Cables themselves do not constitute apparatus as defined in the EMC directive, since they are components and do not have an intrinsic function. When any component is incorporated into an apparatus or system then that apparatus or system, as a whole will be required to comply with the EMC Regulations. The apparatus OEM or system designer should specify cables and installation methods to ensure compliance with the relevant Regulations and Directives (EMC, LVD, Telecoms, Terminals, etc.).

Experience has shown there to be few EMC problems with armoured or screened power cables. This is largely because the electromagnetic field is contained within the earthed envelope of the steel wire armour or screen, and so interference with adjacent apparatus is limited. EMC is considered a much greater problem when un-armoured and/or un-screened cables are used in conjunction. The best situation is obtained when both the influencing (i.e. power cable) and influenced (i.e. control cable) are both either armoured or screened, and are separated by the maximum possible distance.

General Principals for Power Cables

In order to minimise EMC, the following general principals should be adopted.

Achieve balanced circuits - i.e. the three phases carry equal current (referred to as balanced loads).

Largest separation possible to sensitive circuits

All screens and/or armour of cables should be effectively earthed.

The following reference document is an ERA Publication which goes into more detail in this area and may be of assistance. It includes tables of separation for differing types of cable designs. This report is copyrighted but details can be obtained below.

The document is entitled:	Cabling Installations: User Friendly Guide
Author:	D A Atkey
Report No:	ERA Report No. 98-0668
ERA Project:	33-01-0288
Published:	1998
Contact:	023 8033 2271 or https://www.rina.org/en

Electric and Magnetic Fields & Safety

Electromagnetic field strength of a 3core 11kV XLPE armoured cable to BS6622 / BS7835

A solidly bonded 3 core cable will have a 'very low' surrounding magnetic field. The trefoil arrangement of the cores will tend to cancel out the magnetic field particularly if the phase currents are balanced. Also the eddy currents and circulation currents generated in the armour will produce a field tending to oppose the 'primary' field and nullify it. Since the magnetic field is only dependent upon the current flowing and not the voltage, the magnetic field around an 11kV cable will be no more than that around an LV.

The Energy Network Association (ENA) publishes an informative document "Electric and Magnetic field – the facts".

Also Electromagnetic Interference EMI / Compatibility is dealt with in Section 444 of BS7671, the Wiring Regulations