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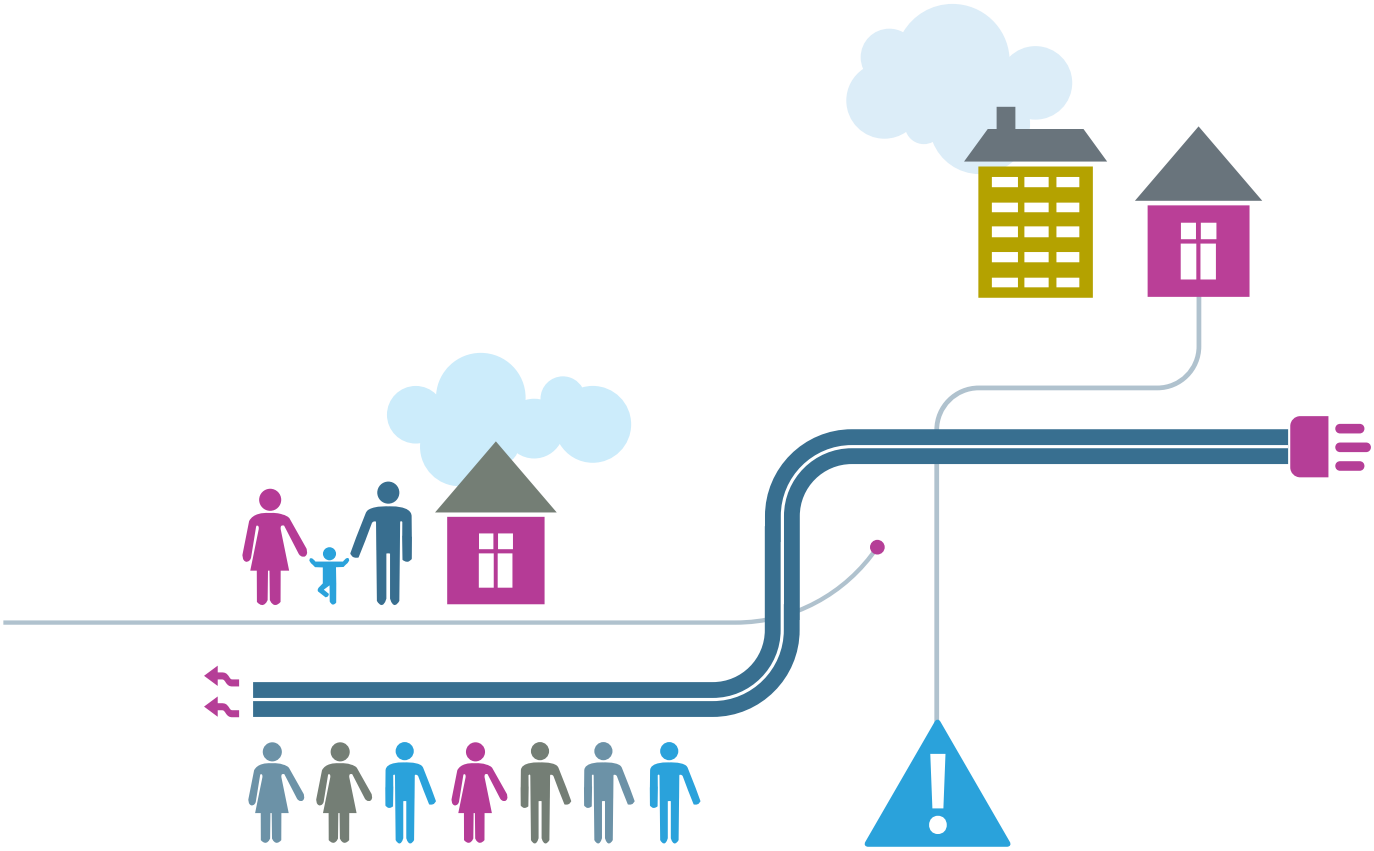
LEGISLATION: WHY LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR ASSEMBLIES MUST COMPLY WITH THE BS EN 61439 SERIES



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Legislation: why low-voltage switchgear and controlgear assemblies must comply with the BS EN 61439 series

Low-voltage switchgear and controlgear assemblies are at the heart of most electricity distribution networks. Very few assemblies cause any problems throughout their life. This is in part due to many never, if ever, being fully loaded or being subject to a design limit occurrence. However, if issues arise it can be many years after the initial installation and if they do arise, the consequences can be severe. A failure within an assembly can cause immense disruption, there may be a risk of electric shock and fire, loss of services or production, possible injury to personnel and in extreme cases death. In such circumstances the manufacturer and purchaser can face significant legal problems if 'best practice' to avoid such occurrences has not been followed.

Legal aspects

In the UK the legal 'traps' waiting to catch the uninformed or those who take risks come in several guises. Some arise from common law, some are more focussed Directives and others arise from contract.

Whatever product is manufactured or purchased the parties involved have **legal obligations**. All parties have an obligation to ensure as far as reasonably practical that any products manufactured and used are safe for their intended use. Due diligence must be applied. If, following an incident, negligence on the part of the manufacturer and/or purchaser is proven, the penalties can be significant.

Once an assembly is in service the Electricity at Work Act may be applicable. If there is an incident involving risk to, injury of, or death of personnel, the Health and Safety Executive (HSE) are likely to be involved. Their first call is usually on the owner/purchaser. If it is considered the fault was because of poor design or workmanship, the assembly manufacturer will be implicated. Responsibility in such circumstances is generally not time barred. In the event of a breach of the law, punitive fines may be applied and in extreme cases the liberty of the individuals deemed responsible may be at stake. Those identified as responsible can be Corporate or the individual who was responsible for the defect.

In addition to obligations in respect of safety, manufacturers and or sellers of products should not make exaggerated or false claims regarding the capabilities and performance of their products. Doing so is illegal and can lead to fines and a much-damaged reputation. Claims of compliance with standards when it is not true is a breach of the Trade Descriptions Act or Consumer Protection from Unfair Trading Regulations 2008.

Hidden or latent defects; defects in materials and workmanship that cannot be readily identified by the purchaser can be pursued, in some circumstances up to 15 years, from date of supply. This applies regardless of any contract.

Manufacturers or other vendors who supply assemblies, e.g. consumer units, direct to the public are also subject to the more stringent Consumer Rights Act. With this there is a requirement to ensure the goods are fit for purpose and a need to take into consideration foreseeable misuse in the design and supply of the product.

In addition to the common law, there are legal requirements focussed directly on electrical equipment. All the applicable European Directives which have been enacted into UK law must be met in full. Whilst several, dependent on the application, are applicable to low-voltage switchgear and controlgear assemblies, all assemblies must meet the Low-voltage Directive and the EMC Directive. Other Directives may apply for specific applications i.e. RED. Compliance with the applicable Directives is not optional; the assemblies must comply and be CE marked to show they meet the essential safety requirements of the relevant Directives. Breaches in compliance can result in heavy fines and/or imprisonment.

With every purchase there is a formal or implied contract. Normally liabilities under contracts can persist for six years, but if signed under seal, the contract limitation period doubles to 12 years under English law. Contracts always have some form of understanding that the goods will meet a standard or be suitable for some function or application. They may also need to be 'fit for purpose', a broad and subjective requirement. Whether the contract period is 6 or 12 years, any commitments made in the contract must be honoured for the whole of the contract period. Expiry of the warranty does not automatically relieve a manufacturer of their obligation to have provided equipment in accordance with the contract. If default to contract is established any time during the contract period, a claim for compensation can be pursued unless barred by valid exclusions of liability.

The function of a low-voltage switchgear and controlgear assembly is complex. Its routine task is to distribute and manage power supplies. If loads increase over time, or materials age prematurely, issues can emerge that result in partial or total failure of the assembly; for example, under rated components and/or assemblies can over-heat and potentially catch fire. The second function of the assembly is usually much more stressful for the assembly, but is rarely and unpredictably called upon. It is the assembly's duty to protect, and when necessary, safely clear faults in other parts of the network. Such faults can emanate from a short circuit, a voltage spike or similar somewhere in the network. The assembly must be capable of managing such incidents, so long as they are within agreed design limits. Without a structured series of verifications, it is almost impossible to confirm that an assembly can perform all its expected functions.

The solution

Having identified some of the issues that can arise, how can manufacturers and purchasers of low-voltage switchgear and controlgear assemblies eliminate their risks in law, or at the very least significantly mitigate them? Anyone who manufactures an assembly is deemed to have the competence to do so. They must ensure the product they provide is safe, 'state of the art' and complies with the requirements specified in the contract. Equally those who purchase assemblies have an obligation to ensure they have specified an assembly that is safe in use and suitable for the application. Not having the necessary level of skill and knowledge to ensure the correct assembly is specified and provided for an application, and that it is correctly used once installed, is not a defence in the eyes of the law.

With so many potential legal issues to consider the first thought may be that all assembly manufacturers and purchasers should be fully qualified solicitors. Fortunately, there is an easier solution; that is; to ensure all assemblies comply with the applicable part of the BS EN 61439 series of standards.

Whilst compliance with standards is not an absolute defence in all circumstances, it will in most cases be sufficient. A product complying with a European Standard, when the standard is listed in European Journal (OJ), is deemed to comply with the essential safety requirements of the applicable European Directives and can be CE marked accordingly. There are other routes to demonstrating compliance with the Directives, but in general they are more time consuming and costly to apply. No assembly should be CE marked or sold if it does not comply with the applicable Directives.

For other legal considerations, compliance with the applicable part of the BS EN 61439 series for assemblies will be seen as good practice and using state of the art principles. Any assembly provided in compliance with the BS EN 61439 series is therefore assumed to take advantage of latest knowledge and experience. It is generally accepted to be the most appropriate at the time of supply. This, of course, assumes the correct assembly for the application is specified at the time of purchase.

Specifying and manufacturing an assembly in accordance with a standard has a second benefit. By referencing the appropriate part of the BS EN 61439 series in a contract, specific minimum requirements are defined. In addition, each part of the BS EN 61439 series lists many options that should be specified at the time of purchase. In effect this is a check list to aid the specifier in defining precisely their requirements.

The comprehensive design verifications required by the standard ensure the assembly has the necessary capability and performance. The routine verifications prescribed ensure, as far as practical, that any assembly produced is free from material workmanship defects, thereby significantly reducing the risk of latent defects.

At first sight the BS EN 61439 series can appear very daunting; requiring many expensive verification tests. This is true for the high rated current, high fault current assemblies, but it is not the case for smaller assemblies with rating up to around 200A. These can be provided with very few verification tests by just following the alternative design verification methods defined in the standard. Where a manufacturer does not wish to carry out design verifications, particularly in the case of higher rated assemblies, there is always the option of working with a partner who can provide a design verified kit. Contrary to the belief in some establishments, design verification according to the standard, can be undertaken by a different party from the one that assembles the assembly. There is no reason why every assembly cannot fully comply with the applicable part of the BS EN 61439 series of standards.

To conclude

Ensuring an assembly complies with the applicable part of the BS EN 61439 series protects manufacturers and purchasers/users.

Any purchaser/user that does not specify assemblies are to be compliant with BS EN 61439, and does not ensure the assembly provided is compliant, should satisfy themselves by other appropriate means that the assembly eliminates, or at the very least minimises, their exposure to risk under the various applicable laws. Reference to and use of the standard avoids the need to identify and consider many detailed constructional, performance and safety issues. It enables the requirements for an assembly to be defined with minimal risk, and for those requirements to be precisely specified in a contract.

Manufacturers who adhere to the applicable part of BS EN 61439 series have the comfort of knowing they are providing assemblies that are 'state of the art', with a defined capability and performance, and as far as is reasonable possible, compliant with all legal obligations.

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