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CEL
CHARLES ENDIRECT LTD

ELECTRICAL DISTRIBUTION PILLAR SPECIFICATION SERIES BS EN 61439

BACKGROUND

In the electrical industry the basic specification for the manufacture and installation of all electrical products is covered by a series of international manufacturing and product installation standards. All products whether just a single component or a group of components must be manufactured safely, specified correctly and fit for their intended purpose when installed.

All electrical product standards are there to ensure that everyone in the supply chain; from the manufacturer and specification provider, through to the end user, are producing, prescribing and using equipment that is essentially and fundamentally safe.

In the United Kingdom electrical installations must comply with BS 7671:2008(2015) 17th Edition of the IET Wiring Regulations for Electrical Installations. In addition to help the specifier and end user BS 7671 (Appendix 1) provides a list of additional standards that are referenced to give users confidence they are complying with the correct product Standards; for example, a circuit breaker must comply with BS EN 60898-1: 2003(2012) and a switch fuse with BS EN 60947-3: 2009.

In the street lighting industry we regularly, see a number of references to BS 7671 with respect to a wiring installation but in other areas product standards are not so widely referenced. There are some obvious ones, like BS 7654:2010, the specification for single phase street lighting cut-out assemblies and IEC 60269 Series 1-6, which relates to low voltage fuses. One area where no standard is obvious, or used, is the specification for street lighting distribution pillars.

However in Part 7, (new section) 714 "Outdoor Lighting Installations" there are references to the access of the distribution pillar itself and electrical protection, in 714.411.2.201, it states:
"A door giving access to electrical equipment and located less than 2.50M above ground level shall be locked with a key or shall require a tool for access. In addition, basic protection shall be provided, when the door is open either by use of equipment having at least a degree of protection IPXXB or IP2X by construction or by installation, or by installing a barrier or an enclosure giving the same degree of protection"

A Charles Endirect Distribution Pillar

To help further understand the relationship between BS 7671 and national manufacturing standards, BS 7671 Part 1 Chapter 11, 113.1 states,
"The Regulations apply to items of electrical equipment only so far as selection and application of the equipment in the installation are concerned. The Regulations do not deal with requirements for the construction of assemblies of electrical equipment, which are required to comply with appropriate standards".

This means that whilst we must ensure that the final installation complies with BS 7671, an assembly of products cannot, and therefore should not be specified against it.

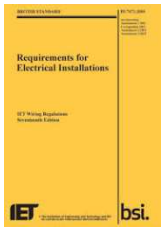
It further states in Part 1, Chapter 13, 133.1.1 Fundamental Principles,:
"Every item of equipment shall comply with the appropriate British or Harmonised Standard. In the absence of such a standard reference shall be made to the appropriate International (IEC) Standard or to the appropriate standard of another Country".

This tells us that the product specified must comply with a recognised standard. In conclusion, installations must comply with BS 7671 but the products that are used in the installation must be specified to and comply with the relevant National or International Standard.
It is therefore clear that everyone manufacturing, specifying and installing electrical equipment has a clear responsibility to ensure they comply with the correct product or installation standard.

So, as a Designer, Consultant or Street Lighting Engineer how can you make sure the product is safe and fit for purpose? How can you show you are acting professionally and responsibly in using the standards laid down by BS 7671 and how can you protect yourself in the event of a failure or accident if the product you are specifying has no standard?

At Charles Endirect Ltd. we have always taken great pride in the manufacture of high quality products which are safe and fit for purpose. As part of this continuing commitment we have looked very closely at our range of distribution pillars to ensure we always manufacture to the recognised Standards. We have identified and follow the International Standard during our manufacturing process and always put our products through a comprehensive test procedure which is applied to ensure we maintain the highest possible quality.

WHICH STANDARD?



As previously stated all components and products must be manufactured to a recognised standard. Within a typical distribution pillar there will be a mixture of various products and associated standards, the difficulty is to link all the different products into a standard once they have been assembled into a complete unit.

The British Standard which applies to electrical products is Series BS EN 61439:2013,**Low Voltage Switchgear and Control Gear Assemblies.**
Assemblies shall comply with the relevant part of series BS EN 61439 that being part 2 of the standard onwards.
Part One, General Rules of the Standard specifically lays down the definitions and states the service conditions, construction and verification requirements for Low Voltage Switchgear and Control Gear Assemblies. This also applies to all assemblies whether they are designed, manufactured and verified as a one-off or fully standardised and manufactured in quantity. ***(The Standard cannot be used alone to specify an Assembly or used for the purpose of determining conformity.)***

The Standard however, does not apply to individual devices and self contained components, such as motor starters, fuse switches or electronic equipment etc., they will comply with their own relevant product standard.

Part 1, Section 3 Terms and Definitions describes an **Assembly**, as relating to the combination of one or more low voltage switching devices together with associated controls and an **Assembly System** which defines a full range of mechanical and electrical components used together, such as enclosures, bus bars and functional units.
We can, from this information determine that a pre wired distribution pillar can be covered by either an assembly or an assembly system within these two definitions. The next stage therefore is to ensure that the product CEL design, manufacture and supply meet all the requirements of this Standard.

DESIGN AND CONSTRUCTION

The starting point to successfully ensure that the product complies with a standard will always be at the design stage. The product design must consider the requirements of the standards; and apart from scope and definition, must ensure that we include the electrical characteristics, product information, service conditions, and design and construction. Only when the above criteria have been achieved can the assembly or assembly system be considered for use within the distribution pillar or control panel.

Relevant testing of the assembly against the standard is now required to ensure that the product complies. The test results are then recorded as supportive evidence to show that the requirements of the relevant Standard have been met. Once this has been achieved, certification can be issued to support the duly tested distribution pillar.

At Charles Endirect we have heavily invested in a specialist team to design, construct and undertake all the relevant manufacture and testing of our distribution pillars. The responsibility of the team is to work very closely with our own Sales Managers, our Client's and end Users. This close working environment will ensure that the final product meets both the Customers requirement and the relevant Standard enabling successful testing and certification to series BS EN 61439.

Upon receipt of an enquiry to our Head Office or one of our Regional Sales Engineers, close liaisons with the Customer will start immediately. Once we have determined the Customer's requirements the Sales and Technical Departments will produce drawings of the distribution pillar along with detailed components list and electrical schematic drawings in accordance with the relevant standards.

The drawings will then be submitted to the Customer for approval. Once this approval has been received for the pillar, the components and relevant electrical equipment will be sourced and ordered, then the manufacture of the distribution pillar or control panel will be added to our current program of works with a completion date given to the Customer.

TESTING.

The new standard BS EN 61439-1-2011 is more detailed than the previous one. The complete schedule of testing required is shown in Annex C table C1 and Annex D, table D1. The essential areas for testing pre wired distribution pillars are taken from these tables.

These tables are intended as guidance for the identification of supplied items tested by manufacturers which is subject to an agreement between the manufacturer and CEL. These tables are intended to be used and developed in the relevant assembly standards. In some cases, information declared by the manufacturer may take the place of an agreement.

ROUTINE TESTING:

Our routine testing is carried out in accordance with the current IET 17th Edition Wiring Regulations and performed on every unit we manufacture. The distribution pillar or control panel is designed to ensure all the products we use are safe and will function correctly. These tests are as important as the required BS EN testing. The BS EN 61439-1 tests can be supported by external supplier's testing. Routine tests are the ongoing daily proof of the manufacturer's capability to produce safe products.

As a common example the use of a commercial distribution board fitted with din rail and supplied with miniature circuit breakers or fuses is in itself referred to an assembly, however, if this assembly is installed into a distribution pillar and connected to other distribution and control equipment, it then becomes an assembly system.

Under the BS EN Standard there are a series of type tests that must be performed to ensure both types are compliant. These tests can be performed in various ways depending on the design, construction and application of the distribution pillar. However before the certificate can be issued we must be sure that we have complied with every relevant part of the testing requirement. We select the appropriate testing from the list of type tests shown in Annex C, table C1 and Annex D, D1 of BS EN 61439-1.

Testing at Charles Endirect

TYPE TESTS:

At Charles Endirect Ltd, our routine testing regime is linked to the testing requirements of BS EN 61439, this procedure ensures the testing is efficient and most importantly, effective. Because a BS EN Standard is an all encompassing document, it can only generalise in certain areas and not be specific to equipment. A typical example of this can be seen in the mechanical and electrical checking of cable terminations which can, according to the Standard, be possible by “random checking”.
For example at CEL we do, as a matter of course mechanically and electrically check 100% of all our connections prior to despatching our distribution pillars. This is just one example of the areas where we exceed the requirements of the standard.

Our entire testing regime is carried out in house by one of our trained Electrical Engineers. To enable us do this we have invested in unique test equipment, which had been specifically designed to ensure the testing is fully compliant with the type test requirements of BS EN 61439-1. All our electrical test equipment is annually calibrated by the original manufacturer, who then certifies the equipment to prove safe condition and correct operation.

All our test results are individually logged into a purpose designed database which requires a specific test to be passed and then recorded before the next part of the test can be carried out. Should the database not receive a test result then it will not allow the next test in the sequence to be carried out. Only when the database has received all the recorded test results will it allow the final test certificate to be produced. The electrical test area has been specifically designed with strict safety precautions in place for the task with only experienced personnel permitted to carry out the testing.

This procedure results in an effective solution to ensure all the correct tests are carried out and all results recorded. The test file is backed up everyday onto the company server, which ensures full traceability if required in the future.

INFORMATION TO BE SUPPLIED BY THE MANUFACTURER:

BS EN 61439-1 Chapter 6 clearly states that the appropriate manufacturers technical information and documentation regarding the assembly shall be provided at time of delivery. The necessary information supplied shall cover the handling, installation, operation and maintenance of the assembly and the equipment contained therein.
The provision and weight details of distribution pillars are important in connection with transport and handling of the assemblies. If lifting of the assembly is required then the correct location and lifting attachments shall be provided in the Manufacturers documentation.

Clause 5 of BS EN 61439-1 clearly states which information should be given and the various options and different ways open to the manufacturer on how to provide it. The main criteria, whichever format is used, is that the information must be provided. The following examples give three areas where essential information is required;

NAME PLATE:

The distribution pillar shall be fitted with one or more identification labels. The name plate will show the manufacturer's name or trade mark, along with the type or identification number of the assembly including the date of manufacture.

The provision of this detail ensures traceability and relevant information provided from the assembly manufacturer. At Charles Endirect Ltd every distribution pillar is given a unique reference and job number that can be found on the nameplate fitted inside of the door. The information on the nameplate must be clear, durable, legible and visible, and to ensure compliance a purpose designed printer has been purchased to produce the nameplate in line with the requirement of the standard.

COMPONENT IDENTIFICATION:

The individual circuits and protective devices, inside the distribution pillar, must be clearly identifiable and labelled. Identification tags shall be legible, permanent and fit for their physical environment. The relevant tagging and labelling shall match the wiring or schematics supplied with the assembly.

INSTRUCTIONS FOR INSTALLATION, OPERATION AND MAINTENANCE.

The assembly must be supplied with the appropriate documentation and instructions regarding separate components and assemblies to aid and assist the installer and end user. It is also recommended that wiring diagrams or tables are provided especially if the identification of individual circuits and protective devices are not easily recognisable. The circuit diagrams or schematics must then reflect the labelling applied to the distribution circuits.
All the documentation provided by CEL will be contained within the document holder located inside the pillar. There is some additional information contained within which serves as a reminder to the Installation Engineer of his responsibilities. For example, our highlighting of the installation standards within the documentation pack reminds the Engineer that all components and cable connections shall be checked prior to completion and before the distribution pillar is energised.

Although every terminal connection is checked during the build and prior to delivery, transport vibration and cable compression can cause terminals and enclosure covers to loosen. It is therefore good working practice to check all components and terminal connections prior to commissioning.

SUMMARY:

Charles Endirect Ltd has invested a lot of time, research and development into our product range to ensure the continuing improvement in the design, manufacture and testing of our distribution pillars. We have, and will continue to invest heavily in this area as we see it is clearly the responsibility of all within the supply chain to ensure for a safe, fit for purpose product that is delivered to the customer. As a manufacturer we are a key part of that supply chain.

In the past the Street Lighting Engineer, Consultant or Specifier has had only their judgement and experience to rely on in the supply and installation of pre wired distribution pillars. This, as we all know could have been open to challenge and question as to the quality and integrity of the product.

Charles Endirect Ltd. is now a leader in the market place by offering a clear product standard for the Street Lighting Engineer to use and the confidence to specify our assemblies knowing that our products are manufactured, assembled and tested in accordance with series BS EN 61439 and BS 7671. The Company is also accredited to ISO 9001 therefore providing peace of mind and confidence in the final product.

June 2015

OTHER PRODUCTS

As well as Distribution Pillars, Charles Endirect Ltd also produce and manufacture:
♦Cut Outs ♦Isolators♦Earthing - CETs ♦Feeder Pillars ♦Belisha Units including Solar Powered
♦Passive Safety Systems ♦CELtek CMS ♦CELtronic Ballasts ♦GIFAS Floor Pits
We manufacture our own metalwork and assemble pre-wire cut-outs, isolators, feeder pillars etc, at our premises in Wincanton
We therefore keep control of our customer's requirements from order to despatch

For further information please contact either our Customers Services Team at Head Office or you Area Sales Manager. They will be able to provide any help you require.

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