

Battery Energy Storage Systems

Typical Standards List

Statutes

Health and Safety at Work Act 1974	Health and Safety at Work Act 1974 and associated regulations
CDM Regulations 2015	Construction, Design and Management (CDM) Regulations 2015
Management of Health & Safety at Work 1999	Electricity at Work Act and associated regulations
Electricity at Work Regulations 1989	Electricity at Work Regulations 1989
ENA EREC G5-5	(ENA) Engineering Recommendation G5 Issue 5
ENA EREC G99	(ENA) Engineering Recommendation G99 Issue 1
CUSC	Connection and Use of System Code & Grid Code
EC Directives & Legislations	Applicable EC Directives and Legislations

General Electrical Works

BS 7671	Requirements for LV Electrical Installations
BS EN 60529	Degrees of protection provided by enclosures (IP Code)
BS EN 61000 Series (including -)	Electromagnetic compatibility (EMC)
BS EN 61000-6-4	Electromagnetic compatibility. Generic emission standards
BS EN IEC 61000-6-2	Electromagnetic compatibility. Generic standards – Immunity standard for industrial environments
IEC 61140	Electrical low voltage installations: Protection measures against electrical shock
IEC 61936	Power Insulations exceeding 1 kV



BESS

BS EN 3	Portable fire extinguishers
EN 50110 Part 1 and 2	Operation of electrical installations
EN 50178	Electronic equipment for use in power installations
IEC 60695-1-11	Fire hazard assessment
NFPA 855	Standard for the Installation of Stationary Energy Storage Systems

Batteries

EN 50272-1	Safety requirements for secondary batteries and battery installations
IEC 61427-2	Secondary cells and batteries for renewable energy storage – General requirements and methods of test – Part 2: On-grid applications
IEC 62281	Safety of primary and secondary lithium cells and batteries during transport
IEC 62485-1	Safety requirements for secondary batteries and battery installations – Part 1: General safety information
IEC 62485- 2	Safety requirements for secondary batteries and battery installations – Part 2: Stationary batteries
IEC 62619	Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and batteries, for use in industrial applications
IEC 62620	Secondary cells and batteries containing alkaline or other non-acid electrolytes – Secondary lithium cells and batteries for use in industrial applications

Cabling

BS 6622	Electric cables. Armoured cables with thermosetting insulation for rated voltages from 3.8/6.6 kV to 19/33 kV. Requirements and test methods
BS 7870-4	LV and MV polymeric insulated cables for use by distribution and generation utilities. Specification for distribution cables with extruded insulation for rated voltages of 11 kV and 33 kV
BS EN 50288-7	Multi-element metallic cables used in analogue and digital communication and control. Sectional specification for instrumentation and control cables
BS EN 60230	Impulse tests on cables and their accessories
BS IEC 60287	Electric cables. Calculation of the current rating. Current rating equations (100% load factor) and calculation of losses. Current sharing between parallel single-core cables and calculation of circulating current losses
BS EN 60228	Conductors of insulated cables
BS EN 60794-1-1	Optical fibre cables
IEC 60502	Extruded solid dielectric insulated power cables for rated voltages from 1kV to 30kV
IEC 60099-4	Metal-oxide surge arrestors without gaps for AC systems
IEC 60228	Conductors of insulated cables
IEC 60840	Power cables with extruded insulation and their accessories for rated voltages above 30 kV up to 150 kV – Test methods and requirements
IEC 60853-2	Calculation of the cycle and emergency current rating of cables
IEC 60885-3	Partial discharge tests



Civil Works

EN 1990	Basis of Structural Design
EN 1991	Actions on structures – General actions – Densities, self-weight, imposed loads for buildings
EN 1992	Design of concrete structures
EN 1993	Design of steel structures
EN 1994-1-2	Design of composite steel and concrete structures – General rules. Structural fire design
EN 1997	Geotechnical Design – General Rules
BS 8500	Concrete. Complementary British Standard to BS EN 206
BS EN 197	Cement
BS EN 206	Concrete. Specification, performance, production and conformity
BS BS EN 206	Design of steel structures
BS 1377	Methods of test for soils for civil engineering purposes
BS 1881	Testing Concrete – Methods for analysis of hardened concrete
BS 6031	Code of Practice for Earthworks
BS EN 13249	Geotextiles and geotextile-related products – Characteristics required for use in the construction of roads and other trafficked areas
BS EN 13251	Geotextiles and geotextile-related products – Characteristics required for use in earthworks, foundations and retaining structures
BS EN 13252	Geotextiles and geotextile-related products – Characteristics required for use in drainage systems
BS EN 13670	Execution of concrete structures
BS EN ISO 12944	Paints and varnishes – corrosion protection of steel structures
BS EN 14782	Self-supporting metal sheet for roofing, external cladding and internal lining. Product specification and requirements
Design Manual for Roads and Bridges (DMRB)	CD 123 – Geometric design of at-grade priority and signal-controlled junctions.



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Earthing Lightning Protection

IEEE 80	A guide for safety in AC substation grounding
IEEE 81	Guide for measuring earth resistivity, ground impedance & earth surface potentials of a ground system
ENA EREC S34	A guide for assessing the rise of earth potential at electrical installations
ENA Technical Specification 41-24	Guidelines for the design, installation, testing and maintenance of main earthing systems in substations
BS 7430	Code of practice for protective earthing of electrical installations
BS EN 13601	Copper and copper alloys. Copper rod, bar and wire for general electrical purposes
BS IEC 60479-1	Effects of current on human beings and livestock. General aspects
BS EN 62305	Protection against lightning

Protection & Control Equipment

BS EN 60255-1	Measuring relays and protection equipment – Part 1: Common requirements
BS EN 60269	Low-voltage fuses - Supplementary requirements for fuses for use by authorised persons (fuses mainly for industrial application). Examples of standardised systems of fuses A to K
BS EN 60898-1	Electrical accessories. Circuit breakers for over current protection for household and similar installations. Circuit-breakers for AC operation
BS EN 61008-1	Residual current operated circuit-breakers without integral over current protection for household and similar uses

Switchgear

IEC 60060	High-voltage test techniques
IEC 60071	Insulation co-ordination
IEC 60085	Electrical insulation – Thermal evaluation and designation
IEC 60099	Surge arresters
IEC 60137	Insulated bushings for alternating voltages above 1000 V
IEC 60270	High-voltage test techniques - Partial discharge measurements
IEC 60273	Dimensions of indoor and outdoor post insulators and post insulator units for systems greater than 1000 V.
IEC/TS 60815-2	Selection and dimensioning of high voltage insulators intended for use in polluted conditions. Part 2: Ceramic and glass insulators for A.C. systems
BS EN IEC 60947-1	Low-voltage switchgear and controlgear – General rules
BS EN IEC 60947-3	Low-voltage switchgear and controlgear – Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units
BS EN IEC 61439	Low-voltage switchgear and control gear assemblies
IEC 61869	Instrument Transformers
BS EN 62271-1	High-voltage switchgear and controlgear – Common specifications for alternating current switchgear and controlgear

BS EN IEC 62271-100	High-voltage switchgear and controlgear Part 100: Alternating-current circuit-breakers
BS EN IEC 62271-102	High-voltage switchgear and controlgear Part 102: Alternating current disconnectors and earthing switches
BS EN 62271-200	High-voltage switchgear and controlgear Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV
IEC 60060	Electrical insulation – Thermal evaluation and designation

Transformers

BS EN 50216-1	Power Transformer and Reactor Fittings – Part 1: General
CENELEC – EN 50386	Bushings up to 1 kV and from 250 A to 5 kA, for liquid filled transformers
BS NE 60076	Power transformers
BS EN 60214-1	Tap-changers Part 1: Performance requirements and test methods
BS EN IEC 61936-1	Power installations exceeding 1 kV AC and 1,5 kV DC Part 1: AC

Others

EN 54	Fire detection and fire alarm systems.
BS 1363	13 A plugs, socket-outlets, adaptors and connection units
BS EN 61131-2	Programmable Controllers – Equipment requirements and tests
BS EN 60309-1	Plugs, Socket-Outlets and Couplers for Industrial Purposes – Part 1: General Requirements
IEC/TR 61508	Functional safety of electrical/electronic/ programmable electronic safety-related systems
IEC 62040	UPS systems
IEC 62061	Safety of machinery – Functional safety of safety-related control systems
IEC 62443	Industrial communication networks
IEC 60870-5-104	Transmission Protocols Network Access
BS 8418	Design, installation, commissioning and maintenance of detector-activated video surveillance systems (VSS). Code of practice

How EPS Can Help

At EPS, we specialise in the design and development of cutting-edge battery energy storage systems for our clients. Our specialist electrical engineers provide creative and bespoke solutions for sustainable energy, grid resilience, and cost-effectiveness.

Ranging from **10MW to 400MW**, we provide electrical engineering consultancy and design services that cover both greenfield and brownfield sites. This includes:

- G99 and G100 connection applications
- Grid code compliance (11kV to 400kV)
- Connection management – assistance connecting your BESS to a Distributed Network Operator or National Grid
- Preparation of initial connection assessments, cost estimates, and detailed connection applications
- Power system studies and analysis
- Conceptual design and project development support
- Detailed technical designs
- Earthing studies
- Primary plant layout design (main structures, surge arrestors, circuit breakers, disconnectors, etc.)
- Project management, including close liaison with civil contractors
- Guidance through the regulatory process, risk assessments, and cost analysis
- Selecting the most appropriate battery energy storage equipment for energy efficiency
- Arc Flash Studies
- Secondary engineering (protection, schematics, communication, cables, etc.)
- Feasibility Studies



Looking For Support With Your Next BESS Project?

Speak to our electrical experts today to discuss your project requirements.

Contact Us

